Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Rigid Regimen Prescribed for Seattle

PETER WITT has delivered himself of a broadside in Seattle and presumably has hurried back to Cleveland. The principal thought that he left behind him in Seattle was that co-operation must supplant dissension in the conduct of the Seattle Municipal Railway. Mr. Witt did not worry much about the past in Seattle. He was concerned for the future. And well he might be. With all due respect to Mayor Caldwell, the tendency with him has been to charge the past with most of the misfortunes which loom up in the future.

Mr. Witt has built or recommended for the future from the sound basis that "the entire traction transaction is and morally must by all honorable men be considered a closed incident." His doctrine also is sound that if the enterprise is to be made a success, the principle of "pay as you go" will have to be established and that the time for its establishment is now. Mr. Witt has not been lenient with labor, either. The suggestion which he made in this respect would not, if carried out, promote the political fortunes of those who applied them, but it surely would be wiser to reduce the number of employees and make an annual saving of $800,000 than to reduce wages and save only $100,000. With the people of Seattle paying an 8½-cent fare; with a decrease of 3,054,669 in pay passengers in September, 1921, over September, 1919; with the necessity confronting the city of spending $2,000,000 for trolley improvements; with political dissension quite general, the real need in Seattle is evident. It should be for those in authority to give heed to the advice of the diagnostician by following the rigid regimen prescribed if they would escape the use of the knife by the surgeon in a major operation in the not distant future.

Pittsburgh's Traction Problem Settlement Bright

RESIDENTS of Pittsburgh have a real reason to be happy at the prospect for the new year. They may confidently look forward toward improved transit and the settlement of the thirteen-year controversy between the city and the Pittsburgh Railways. The agreement for the settlement has been duly signed, but two important steps remain to be taken before the plan can become operative. The state Public Utilities Commission must approve the agreement and the company must raise $5,000,000 of additional capital for use as stipulated in the new grant. There is every reason to believe that it will be possible quickly to meet both of these requirements.

The conduct of the negotiations certainly reflects great credit on all who participated in them. The spirit of live and let live was constantly in evidence. This was particularly true of the entrance, at almost the last minute, of Mayor-elect Magee into the negotiations. He received a prompt audience, with the result that the ordinance as slightly amended after passage on first reading is understood to have his full approval. This is particularly beneficial, for it will be during his administration of the affairs of the city that the new measure will go into effect.

Mayor Babcock regards the action of the Council of that city in approving the new traction ordinance as the biggest thing accomplished by his administration. In this he most certainly is correct. It is a real achievement. With the prospect almost certain that the new grant will soon go into effect, it is sincerely to be hoped that the administration of the measure by the city may be carried out in the same broad way that has marked the progress of the settlement negotiations.

Transfers Should Not Confer Stop-Over Privileges

THE design of a transfer ticket, or whatever it is termed locally, presents to practically all railways an ever-present problem, due to attempts to prevent its fraudulent use as fare collection methods are changed or new types of equipment are introduced.

Since the day of its inception each railway has probably tried a large portion of the fifty-seven varieties of transfer design and still there seems to be no universal type. There are all sorts and sizes of transfers—small, medium and large—with a multiplicity of schemes for showing the time limit and the conditions under which they can be used. And, strange as it may seen, each operator believes his own design better than that of any other. Perhaps the best advice that can be given to any company planning to inaugurate a system of transfer is that which Mr. Punch gave to persons contemplating marriage, namely, Don't!

Some companies apparently feel this way, for a study of the situation brings to light that New Bedford and Holyoke have abolished transfers as a part of their fare schemes at present in effect. The Boston Elevated has also adopted a similar rule in connection with the inauguration of the 5-cent fare lines. The abolition of transfers is therefore one way by which a lower initial fare may be granted. Not every company, however, is able for one reason or another to rid itself of transfers. In such circumstances the only course is to make them as fraud proof as possible and at the same time eliminate all possible delays in connection with their issuance by the conductor.

A distinguished salesman in an allied electrical field, but not with practical transportation experience, advised recently on the score of better public relations and salesmanship that the time limit on transfer tickets should be abolished. In other words, he saw no reason why transfers should not permit stop-over privileges for the whole day if a passenger was so disposed. However admirable may have been the intentions of this gentleman, it is inconceivable that such a plan could be put into effect in connection with any flat fare system without great losses to the company. Railway operators would view with askance any plan by which the morning rush-hour passengers could get transfers and then swap

them at their place of business for others from another quarter of the city, thereby getting a round trip for one fare each.

Where transfers must be issued there is every reason that they should not carry any privilege that is not allowed the passenger who crosses a junction point without a change of car. Any other plan than having tranfers good on the first car leaving that junction would be discriminatory. But there is no good reason why the transfer system should be so complicated that it cannot be worked with a fair degree of speed to the benefit of both the operator and the traveling public. The scheme used in Davenport and described in an article elsewhere in this issue appears to accomplish this result.

Improvements, Like One-Man Car, Boost Wages

IN A recent study on "price changes and business prospects" Leonard E. Ayres, vice-president of the Cleveland Trust Company, points out that while the Napoleonic Wars and the American Civil War were accompanied in this country by a series of very high prices, these prices were followed, after a comparatively short time, by a period of gradually falling prices, and that there is much evidence to indicate that the general trend of prices now, for the same reason, will be irregularly downward for a period of years to come. Wages, however, do not seem to have followed exactly the same fluctuations. Statistics in this country are available only since 1820, so that the records during and immediately following the Napoleonic Wars or our own war of 1812 are not available. However, during the Civil War wages rose 50 per cent and then kept on rising until 1869, when there came ten years of decline to about the 1865 level. Here they kept for twenty years, or until about 1900, when they rose for fifteen years gradually, but increased rapidly during the World War.

An important reason often given for the fall of prices following the Napoleonic Wars is the general introduction of machinery in factories during the early part of this century, and Mr. Ayres points out that the Civil War in turn brought the beginning of quantity production and was followed by the general employment in factories of automatic and semi-automatic machinery, electricity and high-speed steel. To these economic advantages in production he attributes largely the fact that wages did not decline with prices because the productivity of the worker was greater. As to whether we are to see wages shrink materially during the next few years, he believes, is largely a question of what happens to the efficiency and productivity of industry. If output per worker does not come up, then wages cannot permanently retain the gains they have made.

Readers of history will remember the fight made by the laborers against the introduction in textile and other factories of machinery. The same arguments were used against its use as are employed today against the one-man car; that is to say, it reduces the number of operators required to do certain work and consequently is a bad thing for the workmen, hence the use of these machines must be stopped. Nevertheless, if we read history aright, the one-man car and similar labor-saving devices are the great hope for the payment of high wages in the future. The position of the workingman will be bettered, not lessened, by these improvements.

New York Is Thinking Seriously of Staggered Hours

IT IS satisfactory to know that an effort is being made in New York to secure some system of staggering working hours and thus increase the capacity of the transit systems. Admittedly the task of obtaining sufficient support of the principle to produce any appreciable effect will be a difficult one. This is not because the difficulty of changing by an hour or so the habits of a community as to the hours of commencing and discontinuing work is a serious one. This is done each year when the daylight saving time goes into force and again when it stops. The difficulty lies in changing the habits of part of the community—often of part of a family—but not of all. This introduces complications in regard to hours of meals and social activities if the span of time between industries is of any great length, yet it must be if any material gain in transit facilities is to be obtained. Thus Mr. Turner, consulting engineer for the New York Transit Commission, estimates that if it was possible by staggered hours to spread the present rush period in New York so that the subways would be utilized for two hours as they are at present during the existing fifteen-minute rush period, it would increase the capacity of these lines of travel 60 per cent. Gain to the company from the double use of rolling stock during rush hours, however, does not come unless the spread is sufficient so that some of the cars can make a round trip within the specified time.

Up to now the principle of staggered hours has been applied in two ways. One is the plan described above as being considered for New York and best exemplified in the past perhaps by its use during the latter part of the war in the city of Washington, and also during the influenza epidemic in New York City in October, 1918. In both there was a partial spread over two hours, and a less crowded condition of the cars was secured. Both, however, were brought about by a great exigency, and the introduction of the plan in Washington was undoubtedly greatly facilitated by the fact that the working hours of a very large proportion of the population could be determined by one employer—the government. After the armistice, when the number of office workers in the various government departments decreased, the city reverted to its former working hours. The same result followed in New York soon after the influenza epidemic had begun to subside.

While there is not now in New York a crisis of war or disease, there is a very serious lack of transit facilities, and in no other way can the capacity of the subway lines be increased for five years, even if new construction was commenced tomorrow. Hence, it may be that the situation can be brought home so clearly to all concerned, employer and worker alike, that some degree of relief will be obtained. If this is done, steps should be taken to bring the schedules of the commuters' lines into accord with the proposed plan. This was not done in the previous trial of staggered hours in New York.

A variation of the staggered hours plan which is possible when the more extended use of the principle is impracticable for one reason or another remains to be considered. This is the limited staggering of hours of beginning and ending work at different factories located on any particular railway line or of the various departments of a single large factory. This plan has been successfully carried out in Detroit in connection with the largest Ford plant.

Graphic Records Improve Line Maintenance

Methods Employed in Maintaining High-Tension, Trolley, Telephone and Signal Lines on Illinois Traction System Are Successful and the Results Obtained Are Highly Satisfactory —Graphic Records Form an Important Part of the Scheme

SEMAPHORE SIGNALS AND SIGNAL MAINTAINER AND EQUIPMENT PROVIDED FOR HIM ON THE ILLINOIS TRACTION SYSTEM

METHODS of maintaining the high-tension, trolley, signal and telephone lines and miscellaneous electrical equipment on the Illinois Traction System, which are under the direction of John Leisenring, signal engineer, have been developed into a highly successful system which is resulting in economy and a substantial reduction in the number of interruptions to service. A very important part of the scheme is the keeping of graphic records in the office of the department head which enable him to visualize readily the trouble locations and maintenance work done, and hence to direct expenditures for replacements in a way that tends to minimize cases of trouble and keep the property in the best possible operating condition for the money allotted to the work. The work covered by these methods comprises the maintenance of 475 miles of 33,000-volt power lines, the signal lines for 120 miles of protected track, 306 signals, forty crossing bells, the substations and the telephone lines for the system comprising 596 miles of interurban line.

For the high-tension line and trolley maintenance, the system is divided into six divisions with a line foreman in charge of each division. Similarly for the signals, signal lines, crossing bells and telephone lines, the system is divided into seven sections with a signal maintainer responsible for each section and with one extra maintainer who is used to help out with heavy repairs and to relieve any of the others if time off duty is wanted. Each line foreman and each signal maintainer sends in a daily report showing the work done the day before, including each case of trouble that occurred and how it was cleared. A daily report is also sent in by the substation operators. The information from these reports is then transferred to charts or reports covering a period of one month or longer. On a large scale map of the system, which hangs in the office of the signal engineer, the cases of high-tension insulator failures are indicated, as taken from the daily reports, by red-headed pins placed approximately at the location of the trouble; trolley breaks are similarly indicated by yellow-headed pins and pole breaks by black-headed pins, each black pin indicating one or more poles involved in a single case of trouble. The pins on this map are not removed as the trouble is cleared, but are allowed to accumulate during a calendar year. This chart as it appeared early in October is reproduced herewith. If the number of cases of either high-tension or trolley line trouble is abnormally high at any location, or over any section of line, this immediately becomes apparent from the accumulation of pins on the map. Before the end of the year, then, when the time comes for making up the budget for the next year's expenditures, it becomes apparent what sections of trolley and high-tension line are causing undue maintenance costs and therefore should be replaced. In other words, this chart shows at all times very clearly where the weak spots in the lines are, and the appropriations made can then be used to eliminate them. The graphic record also avoids the expenditure of money to replace sections about which there may be an impression that the condition is bad, if no records are kept, when in reality the section in mind may be much better than some other section of line. A case of this kind was brought to light the first year the chart was kept on the Illinois Traction System.

SOME DETAILS OF TROLLEY AND HIGH-TENSION MAINTENANCE

Each month a summary of the cases of high-tension and trolley troubles, taken from the daily reports of the line foremen, is made and a copy is sent to each foreman. Friendly rivalry between these foremen has thus been created and the competition has resulted in unusually good work and consequent lowering of the number of

cases of trouble through the better inspection work done. A report of this kind for the month of July, 1921, is reproduced herewith.

The comparison between divisions indicated in this report is made on the basis of the length of line included in the division and the car mileage operated, both weighted. In the event that a case of trouble is directly due to the fault of some one else it is not charged against the line foreman provided he can produce irrefutable evidence to that effect. It is put up to the foreman to keep the trolley and high-tension line in first-class condition through careful inspection and by working out the spots known to be bad. In this inspection work, the trolley wire is not calipered, but dependence is placed on its appearance as seen from the top of the line car.

SPRINGFIELD, ILL., Aug. 20, 1921.

Line Foremen: Following is report of high-tension and trolley trouble for the month of July:

High Tension

1.	Carson	Cases of trouble in July, 0; since Jan. 1	1
2.	Lewis	Cases of trouble in July, 0; since Jan. 1	3
3.	Herbeck	Cases of trouble in July, 2; since Jan. 1	8
4.	Campbell	Cases of trouble in July, 0; since Jan. 1	9
5.	Elmore	Cases of trouble in July, 0; since Jan. 1	11
6.	Green	Cases of trouble in July, 3; since Jan. 1	13

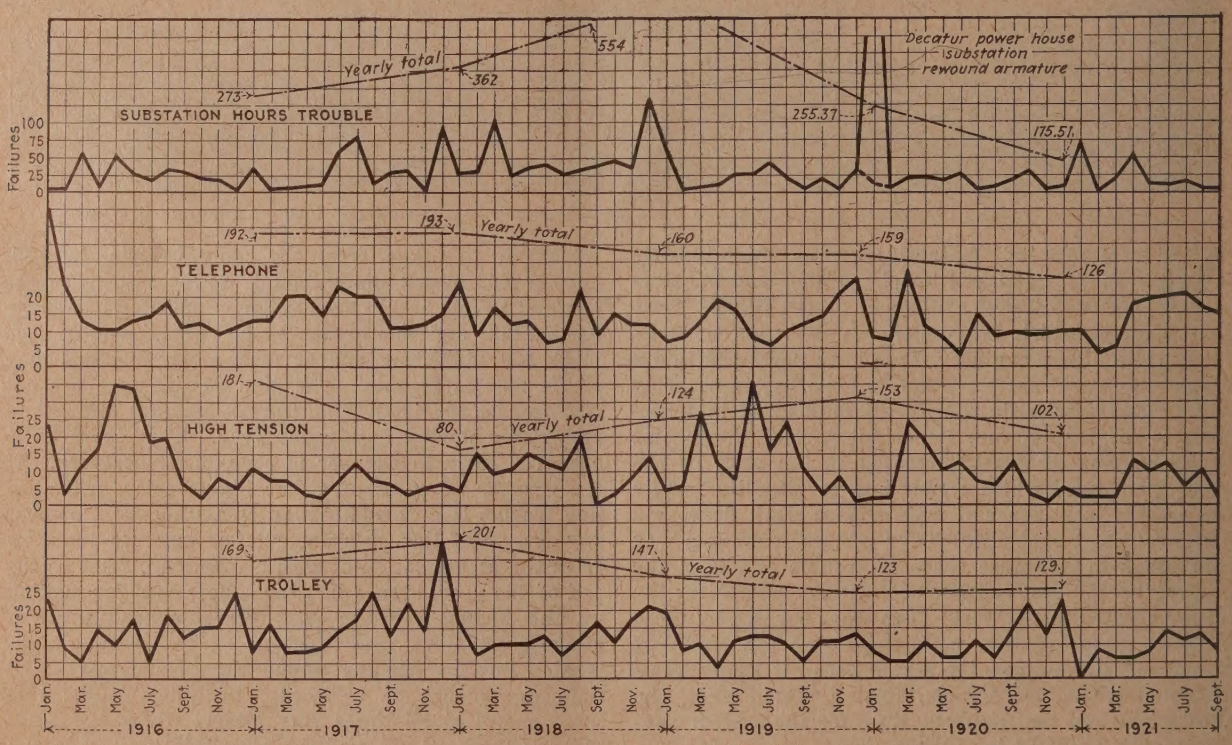
Trolley Trouble

1.	Carson	Cases of trouble in July 0; since Jan. 1	0
2.	Lewis	Cases of trouble in July, 0; since Jan. 1	1
3.	Campbell	Cases of trouble in July, 4; since Jan. 1	9
4.	Green	Cases of trouble in July, 3; since Jan. 1	11
5.	Elmore	Cases of trouble in July, 2; since Jan. 1	15
6.	Herbeck	Cases of trouble in July, 2; since Jan. 1	17

Yours truly,
JOHN LEISENRING, Signal Engineer.

HIGH-TENSION MAINTENANCE WORK

None of the high-tension maintenance work is done with the line hot. It is not considered worth the risk and it has not been necessary on account of the fortunate flexibility of the high-tension system. Because of the location of power houses, it is possible to have three and even four sections of the line at different parts of the system dead at one time without shutting down any substation or in any way affecting operation.



SIX-YEAR RECORD OF TROLLEY, HIGH-TENSION, TELEPHONE LINE AND ROTARY CONVERTER FAILURES

As the number of high-tension insulator failures was becoming very high, the company began back in 1916 and 1917 a close inspection of insulators and replacement of all those which were defective. Killing a section at a time, the poles were climbed and the ties taken off all insulators so that any mechanical or expansion cracks resulting from aging could be seen. At this time all of the insulators had been in service since the line was built, twelve to fourteen years before. All of these old 33,000-volt insulators showing defects were replaced at first with 45,000-volt three-piece insulators and later with two-piece 45,000-volt insulators, Ohio Brass No. 11623, on which the traction company standardized and has continued to use to date.

As the result of the renewals made, the number of failures dropped from 181 in 1916 to 80 in 1917, and the number had been higher than 181 in 1915. Thereafter, with probably one-half of the old type insulators still in service, the number of failures began to increase again until 1919. The failures in every case were found to be the old type insulators. Hence it was decided early in 1920 to replace all the remaining old insulators, whether or not they appeared to be defective, taking the worst sections first as indicated by the failure chart in Mr. Leisenring's office. The maintenance forces were used for this work and they replaced a carload of insulators, 3,000, every two months. Some of the old 33,000-volt insulators taken down have been used on some 11,000-volt lines and some disposed of to another company. Not a single instance of failure has occurred with any of the new type insulators. They have been known to "spill over" but none has been punctured electrically.

The process of replacing the insulators with this new

type is reflected in the downward trend of the high-tension curve in the graphic record of various troubles taken over a period of several years, which is reproduced herewith.

About five years ago the high-tension line was completely rebuilt from Danville to Fithian, a distance of approximately 15 miles. The year before, 20 miles additional between Fithian and Champaign was completely rebuilt, the 45,000-volt three-piece insulators having been used in both cases. For four and one-half years on the former section and five and one-half years on the latter, since the reconstruction, there was not a single interruption of power from any cause.

The good records made by the replacement insulators may be partly accounted for by the fact that the company tests and inspects all insulators at the factory before accepting them. Every insulator is handled for mechanical defects and given a part and assembled flash-over test. Not one out of 100 will puncture under this test, but from 100 to 125 insulators are rejected out of a carload for slight mechanical defects, some of which might not have any effect on the life of the insulator, but the traction company does not take any chance on a slightly warped or bubbled insulator resulting from high firing. Formerly, the inspector for the traction company also gave each insulator a megger high frequency and other tests, but since the results obtained have been so good and the manufacturer on his own account puts insulators to such rigid inspection, all electrical tests except the flash-over have been dispensed with.

No method of testing pin-type insulators while in service has been found which is satisfactory on the Illinois Traction System. Formerly a test was made by the use of a telephone receiver connected to two spikes, one driven into the pole high up and the other down low, in order to hear the static discharge which would result from a defective insulator. It was found, however, that some defective insulators were missed under this test, and also that it was very difficult to pick out the defective one, even though the upper spike were placed near each insulator to differentiate between them by the sound in the receiver.

In the maintenance of the telephone lines, complete failure of transmission or lines too noisy to talk over are recorded as failures and spotted on a chart. The maintenance forces give less attention to the telephone lines because they are less vital to the operation of the road, but some improvement in the number of cases of trouble has been made by keeping after the maintainers and sending out monthly comparative reports to them. The telephone lines of the Illinois Traction System have no protective apparatus or drainage coils, insulating transformers, etc., and interference is taken care of simply by transpositions. Ordinarily the lines are good and clear in spite of the fact that they are carried on the same poles and only 30 ft. from the 33,000-volt transmission line. The principal sources of trouble are from the trolley where a pull-off comes loose and throws up over the telephone line, and from the telephone line coming loose from an insulator and falling down on the cross-arm.

A graphic record is also kept of the number of cases of substation trouble, that is, instances involving a complete shutdown of the rotary converters. The record is divided between those cases where the machine is out more than an hour and where it is out less than an hour. A good many cases of potential trouble are caught by the substation inspector who makes a thorough inspection of each substation every two months and makes a report thereon. He leaves a copy of this report with the attendant and forwards one copy to the substation repair foreman, who takes action as soon as possible on any recommendation made by this inspector. The latter goes over the equipment thoroughly, testing circuit breakers for operation and setting and giving minute attention to the converters and all other parts of the electrical apparatus.

AT LEFT, COMBINATION CROSSING-BELL WIGWAG AND LIGHT WARNING INSTALLED AT FORTY GRADE CROSSINGS. AT RIGHT, TWO OF THE THIRTY-FIVE LIGHT INDICATION SIGNALS ON I. T. S.

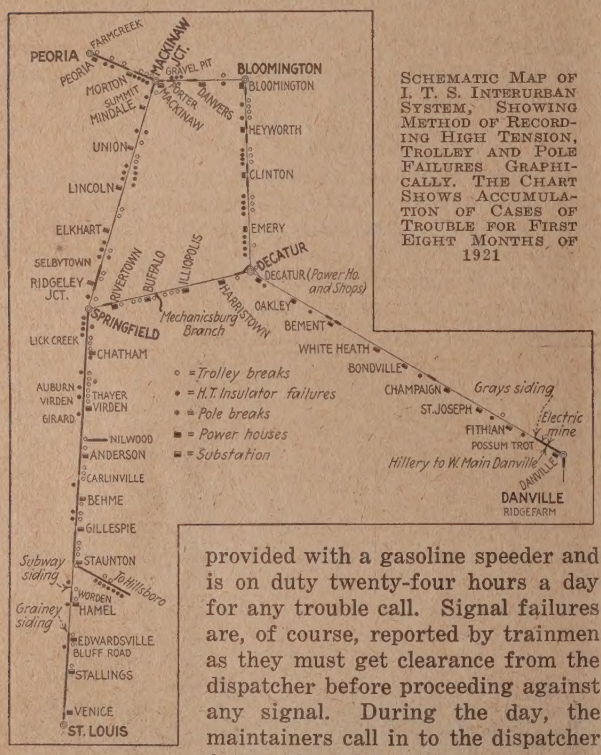
Practically all of the rotary converters on the Illinois Traction System are of 300-kw. capacity, and three of these are Stanley machines. The machine breakers of the 300-kw. converters are set at 800 amp., or 70 per cent overload, while the machines will take an instantaneous swing of 1,000 amp.

Three or four years ago, the slotting of the converter commutators was started and new type brushes substituted. Since that time, also, the slots have been cleaned out periodically with a small tool similar to a short

hacksaw blade, which slots the commutator somewhat as it cleans. The machines are then thoroughly slotted whenever they are in the shop every two or three years. This practice has made a big difference in the operation of the machines, eliminating to a large extent the arcing, avoiding flashovers and in helping to carry heavy overloads.

HIGH RECORD IN SIGNAL MAINTENANCE

As already mentioned, the signals are kept in operating condition by eight maintainers, each of whom is



SCHEMATIC MAP OF I. T. S. INTERURBAN SYSTEM, SHOWING METHOD OF RECORDING HIGH TENSION, TROLLEY AND POLE FAILURES GRAPHICALLY. THE CHART SHOWS ACCUMULATION OF CASES OF TROUBLE FOR FIRST EIGHT MONTHS OF 1921

provided with a gasoline speeder and is on duty twenty-four hours a day for any trouble call. Signal failures are, of course, reported by trainmen as they must get clearance from the dispatcher before proceeding against any signal. During the day, the maintainers call in to the dispatcher frequently and he gives them trouble orders covering any signal failures. During the night the dispatcher reaches these men at their homes. In making his daily report of the general work done, number and nature of signal movements, etc., each maintainer must account for every failure shown on the system operating sheet, a copy of which is kept in the office of the signal engineer as a check on the maintainers. The daily report of each maintainer also shows the number of the signal involved in trouble, the time the maintainer arrives at the signal, the time the signal was cleared, how many trains were given orders against this signal, the cause of the signal failure, etc.

From these daily reports, a monthly graphic signal failure chart is made up for each division, one of these

I. T. S. SIGNAL PERFORMANCE DATA FOR 1921

Month	Total Failures	Due to Bonds	Other Causes	Signal Movements
January	71	28	43	593,360
February	33	19	14	572,759
March	75	40	35	617,372
April	70	26	44	590,118
May	62	19	43	595,012
June	61	21	40	572,034
July	96	23	73	662,772
August	80	24	56	569,247
September	53	13	40	486,268
	601	213	388	5,258,942
Movements per total failure				8,750
Movements per failure, exclusive of bonds				13,554

SPRINGFIELD, ILL., Sept. 10, 1921.

Signal Maintainers: Following is report of signal operation for the month of August:

Maintainers	For the Month — Total Failures	For the Month — Due to Bonds	For the Month — Due to Maintenance	Accumulative since January 1, 1921 — Total Failures	Accumulative since January 1, 1921 — Due to Bonds	Accumulative since January 1, 1921 — Due to Maintenance
1. Dickey	12	5	5	129	74	49
2. P. Cobb	26	9	14	120	49	78
3. P. Lake	7	0	7	130	50	61
4. B. Lahe	6	3	1	46	7	31
5. Augsberger	8	0	5	28	4	17
6. H. Cobb	8	1	3	16	1	9
7. Strope	3	0	3	23	8	14

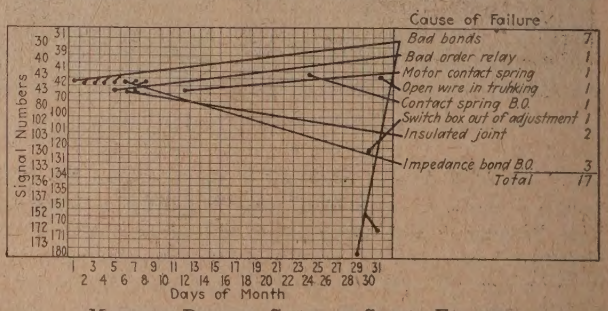
Yours truly,

JOHN LEISENRING, Signal Engineer

being reproduced herewith. The signal numbers are listed in a vertical column on the left and the days of the month across the top. A signal failure is then recorded on this chart by placing a dot opposite the signal number and under the proper date. A line is then drawn from each dot to the right-hand margin where the cause of the failure is written in. In this chart, the repeated failure of any one signal shows up immediately and an investigation follows. For example, in the monthly report reproduced herewith for Division 1 for April, 1921, signal No. 42 was shown to have failed eight times, the cause having been reported as a broken bond for the first five times and a bad order impedance bond for the three other cases. The signal maintainer had found defective bonds and charged the failures to that cause. A check-up on him, however, developed the fact that in replanking a bridge, a spike had been driven into an impedance bond hung underneath the bridge and that this spike caused a spasmodic short circuit, which was probably the cause of the signal failure each time.

A monthly comparative statement of signal failures by divisions is made for each signal maintainer and a copy sent to each. This promotes a healthy rivalry as in the case of the line foreman, though it is necessary to make certain allowances for difference in track conditions and amount of traffic. A copy of one of these reports, covering the month of August, 1921, is reproduced herewith.

All signals on the Illinois Traction System were sup-


Cause of Failure
Bad bonds 7
Bad order relay 1
Motor contact spring 1
Open wire in trunking 1
Contact spring B.O. 1
Switch box out of adjustment 1
Insulated joint 2
Impedance bond B.O. 3
Total 17
Signal Numbers
30 31 39 40 41 43 42 43 70 80 100 102 101 103 120 130 131 133 134 136 135 137 151 152 170 172 171 173 180
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Days of Month

MONTHLY DIVISION CHART OF SIGNAL FAILURES

plied by the Union Switch & Signal Company, and except for thirty-five light indication signals all of the 306 signals are of the semaphore type. They are supplied with energy from a 2,300-volt line derived by stepping up the 370 volts on the secondary side of the main power transformers in the substation. These signal transformers in the substations are 10-kva. and 15-kva. single-phase units. Each signal is equipped with a transformer having one primary and two secondary coils and stepping the 2,300-volt line current down to 110 volts for operating the signal motor and lights and 12 volts for the track circuit.

In the maintenance work, broken track bonds are

temporarily repaired by the signal maintainer by drilling ⅝-in. holes in the rail and channel pinning a No. 6 copper wire around the joint. In some places it is necessary to install two of these No. 6 copper wire bonds to avoid having the return current burn up the bond. Cases of broken rail resulting in apparent signal failures are not recorded against the maintainers, as this is a proper performance of the signal wherein it makes a creditable stop indication.

On account of the high cost of the alternating-current voltmeters required for testing the voltage at the relay terminals, such meters are not supplied to the men to aid them in adjusting the relays. As a substitute, each maintainer is given a shunt of the maximum resistance at which the relay should open. This is used as a check test but does not give the maintainer the privilege of changing the adjustment. The shunt is used to bridge the rails or the relay leads and if the voltage is not excessive the relay should open. If the shunt does not serve to open the relay, the maintainer reports this tendency of the relay to float or not open. Any adjustments are then made by the signal supervisor, but such cases are rare.

The records covering the signal operations on the Illinois Traction System for several years and showing the total number of movements and total number of failures bring out a performance record of a very high number of movements per failure and a protective service better than 99.9 per cent perfect. The performance data for the current year to Oct. 1 is given in an accompanying table. Noticeably fewer failures have occurred with the light indication signals, at least 25 per cent of the failures with semaphore signals being due to mechanical troubles, all of which are of course eliminated with the light signal. Mr. Leisenring's experience is that the light signal is better in every respect.

Selling the Employee on Salesmanship—II

Creating a Pleasant Environment, Forming Correct Habits in Car Operation and Developing Morale Are the Subjects of Mr. Bigelow's Remaining Three Talks to Employees on Making Themselves Better Salesmen of Transportation

BY B. R. BIGELOW
Sales Manager of Transportation, Department of Street Railways, Detroit, Mich.

IN THE first article Mr Bigelow briefly outlined the scope of his duties as a sales manager of transportation. Two of the series of five talks on salesmanship appeared in conjunction with that article in the Dec. 24 issue of the ELECTRIC RAILWAY JOURNAL.

Sales Talk III—Environment

INDUSTRIAL democracy bears the same relation to our business life that home environment does to our domestic life. When we think of home environment we think of many things, but what appeals to us most is the congeniality of the place made possible by loving companionship. When the home folks are away we discover how loudly the clock ticks, how large the rooms are, and that the place we live in is just a house after all. But when the folks come back it is once more a home. Can't you see that every one of us has the privilege of creating that same environment here in our business life by making of ourselves congenial companions to those around us?

A pleasant "good morning" costs nothing but the effort of saying it. Those two words imply much more than that it is a good morning. They imply becoming personal interest in the welfare of the person greeted. Every one of us is more than a stone in the street or a brick in the walk, and our whole being revolts at being passed as such by an associate. We make memories by adhering to these every-day home-like courtesies.

Did you ever think that we make memories every day for our own use in the future? We should try to make such memories to-day that we will enjoy having them recalled on the morrow. It should be our aim to make the kind we will be proud of, and not ashamed of—memories that will bring comfort and not heartache.

Keep in mind that the memories of to-morrow are being made today. Monuments of granite or marble bring to our minds the lives and deeds of the illustrious men to whose memory they have been erected, but it is not possible for the great majority of us to so inspire posterity that we will be so remembered. It is possible, however, for every one of us by honest deeds and considerate acts to erect for ourselves living monuments in the hearts of our associates—living monuments that will inspire right living and hones labor.

We perhaps little realize in our daily lives how many times a day we unconsciously give inspiration to some person because of the efficient manner in which we perform our own work. We, as railroad men, are constantly serving the public, and our opportunities to give inspiration are almost unlimited. It is perfectly natural, at times, to feel as if our efforts are wasted because we receive no visible response from those we serve. Yet we would not stop seeding a newly made lawn because we could not see the seeds develop and grow. On that account we must be constant in our courteous service to the public and the visible response will surely appear.

We are mutually dependent beings; we must give and take in this battle of life. Among ourselves we must be socially magnanimous and, by so doing, we will be able to find ourselves and help others to find themselves. It must be plain to you that in close association we can gain a degree of wisdom because of one another's experiences.

Simultaneous with the development of transportation service, we must strive to develop our serving capacity in order that this railroad, as operated by us, will just naturally be known as the "Courtesy Line."

Sales Talk IV—Habit

Did you ever think of the force of habit? There is an old and true saying that fire is a good servant but a terrible master. The same could be truly said of habits. Habits are good servants but terrible masters.

Habits must be controlled and marshaled in true form. They must be good habits because they are on dress parade all the time. It is not my intention at this time to moralize on the subject, but its behooves every one of us, however, to form correct habits in all relations of life.

Some one asks what has habit to do with car operation. When correct car operation becomes force of habit, said operation is intuitively accomplished. Intuition, as you know, is that instinctive feeling which gives immediate perception of that which is to be accomplished.

By way of illustration; you are walking along a cement walk with a friend engaged in earnest conversation. As you approach the curb your steps are guided by intuition because you do not stumble or fall at that point, but with unconscious perception step off the curb gracefully. You are walking in the country; the wind has caused a heavy branch from a neighboring tree to be thrown across your path. You unconsciously and intuitively step over the obstruction. You do not know or realize just how high you lift your foot in the accomplishment of the act because the intuitive feeling which you possess gives you just the proper perception which makes your action almost involuntary.

MAKING HABIT A VALUABLE ASSET

It is so in car operation. After careful instruction you will be possessed of that instinctive feeling which will give you perception without process of thought. Let me illustrate. You have a car under operation, an automobile whirls in front of that car, you instinctively throw off power and apply the brake. Force of habit perfected by practice eliminates process of thought, and the same becomes intuitive of accomplishment.

I wish just to touch on another phase of force of habit in order to prove conclusively that whatever you do, day after day, over and over again, has a certain hold on you, which is just naturally called force of habit.

By way of illustration, we will assume that in the living room of your home hangs a mirror. Some member of the family decides that the light will strike to better advantage in some other part of the room You move the mirror, so you know it is moved; however, you instinctively go to its old position on more than one occasion, and it is with a mingled feeling of humiliation and surprise that you gaze at the blank wall. This is but one simple illustration of force of habit.

I remember as a boy I came into the old farmhouse kitchen one day and mother said to me, "When you wash your face and hands empty the basin of water into a pail as the waste pipe under the sink is broken." I presume I did a boy's usual good job at performing my ablutions, and force of habit won, because over went the water into the sink and so onto the floor It was a rule in our household that if any member of the family disturbed its tranquillity by careless or thoughtless action he must pay the penalty by putting things to rights. In this case I carefully hand-mopped the kitchen floor. Then I had to wash my hands again and over went the water again. You see what force of habit will do.

Form correct habits in car operation if you would be a successful operator.

Sales Talk V—Morale

Morale is just as important to the railway man as it is to a soldier. What is morale? Primarily, it means courage in the face of danger. In reality it means more than that. Along with courage it means conviction of mastery or ability for success. Every railway man is called upon many times to face an emergency which is dangerous both to himself and to some careless or thoughtless person. I have known perfectly normal men to be so paralyzed by the imminent possibilities of an emergency that they were, for the time being, rendered helpless. Those men lacked morale. Careful preparation for your work brings the necessary confidence that makes morale possible.

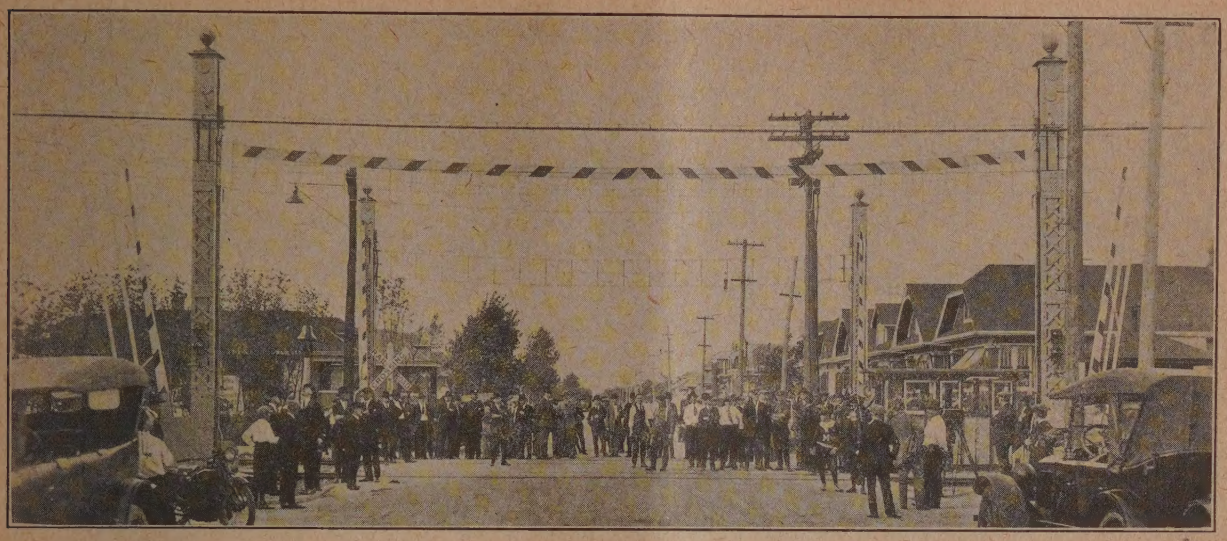
Accidents do not often happen; they are caused. Five principal causes of accidents are inattention, thoughtlessness, undue haste, recklessness and carelessness.

It is much better to take pains in preventing accidents than it is to suffer pains because of them. Presence of mind insures safety. Whenever we are confronted by imminent danger, if we can act with vigilance, care and promptitude, we are distinctly on the side of safety first.

There is an old and true saying that "Self-preservation is the first law of nature." One reason why I am a stanch champion of the Birney safety car is that it is automatic in its operation. If an operator leaves his post of duty the car will stop. However, we must train ourselves to realize our full responsibility for the safety of others by cultivating self-control, and not depend upon automatic devices. As an illustration: Just after a snowstorm last winter a Birney safety car was being operated through the main street of a neighboring city. A snowplow had preceded the car, pushing the snow into a high ridge, with utter disregard to adjacent driveways and walks. In order to clear the space in front of an express office snow had been thrown back onto the tracks, and, with no evil intent perhaps, a section of plank had been buried beneath the snow at this point. The operator of the car, thinking he would be able to speed through the obstruction, put on full power. This carried the car through the snow, but the plank came into contact with the valve of the air tank, which was opened. Thereby the air brake and all automatic devices were made useless. An interurban car was just crossing the intersection beyond the express office as the Birney car emerged from the snow obstruction. The operator coolly reversed power, bringing the Birney to an abrupt stop as the interurban speeded by. The operator, possessed of morale, had averted a serious accident.

I am extremely loath to finish this particular talk, because no man can have too many of the qualities that provide for morale. Remember that a plea of ignorance of car operation will never take away your responsibility in case of an accident. When caution becomes a habit accidents will be few. In closing, I wish to impress upon you that the best safety device on any car is a careful operator.

For the investigation of the standards of practice and methods of measurements of public utilities such as gas, electric light, electric power, water, telephone, central station heating, and electric railway service, the Bureau of Standards is requesting a continuance during the next fiscal year of the $85,000 appropriation with which it has been carrying forward this work.



STEEL-BARRIER TYPE CROSSING GATE THROUGH WHICH AUTOMOBILES CANNOT DRIVE

Positive-Stop Crossing Gates

Unique Steel Cable Barrier Being Tried Out by Chicago Elevated Railroads Will Stop Vehicles Striking It Before They Reach Crossing

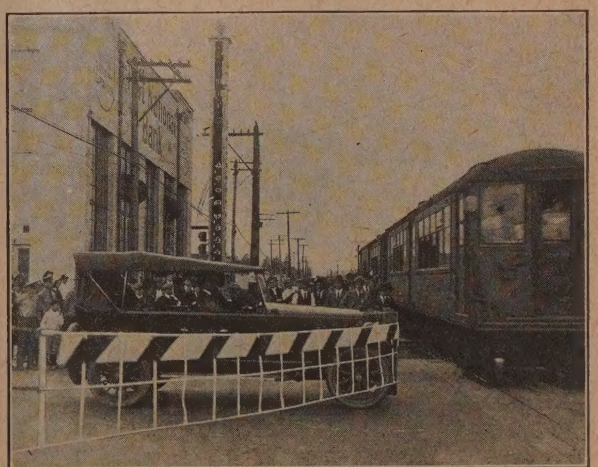
THE Chicago Elevated Railways has made one installation of a unique new type of crossing gate where the Douglas Park line crosses Austin Avenue at grade in Cicero, Ill. This new type of gate is built with the idea that even though a careless driver may run into a lowered gate, an occurrence which often happens, the gate will not be broken but will function as a mechanical means of stopping the car as well as a warning to the driver.

The gate consists of a barrier formed by three ½-in. steel cables attached to a mechanism in a fabricated steel column erected at either side of the road. The entire barrier is lifted vertically in a horizontal position by means of a motor-driven chain mechanism in each column. A plain sheet-metal strip on which alternate black and white bars are painted is attached to the top cable and serves as the usual warning when the barrier is lowered. To lower the barrier, the operator simply throws an electric switch which brings it down into the stop position. Attached to the chain mechanism in each column is a heavy counterweight which raises and lowers with the barrier; that is, the weight is down when the barrier is down.

If an automobile fails to stop and strikes the barrier the first pressure effected is taken up by the raising of these heavy weights. A braking mechanism is connected with the weights so that the higher they are raised the more braking pressure is exerted. When the weights get up to a certain predetermined height, which is governed by the distance between the normal position of the barrier and the track, the weights strike against heavy coil springs which exert the last braking pressure on the motion of the automobile. When these springs are compressed, the automobile must have come to a dead stop just before reaching the track. The cables are claimed to be strong enough to stop any automobile or truck striking the gate at any speed. Successful test stops are pictured below.

The device was designed by the Strauss Yielding Barrier Company, Chicago, J. B. Strauss being the designer of the Strauss bascule bridge, and the installation on the Chicago Elevated Lines is the first to be made. It is probable that several more of these gates will be installed on the Garfield Park branch of the elevated at important intersections, and the further

7,000-LB. TRUCK UNABLE TO REACH THE RAILS WHEN DRIVEN INTO BARRIER AT 15 M.P.H.



WHERE THE AUTOMOBILE WAS STOPPED AFTER BEING DRIVEN INTO THE BARRIER AT 18 M.P.H.

installations will be equipped with five cables instead of three to give added height to the barrier. While crossing protection of this kind is naturally very expensive, B. J. Fallon, general manager of the elevated lines in Chicago, looks upon it as affording a high degree of protection for which the expense is justified at important crossings, particularly where there may be an influence working to force elevation, for draw-bridge approaches, etc.

Attractive Elevated Stations

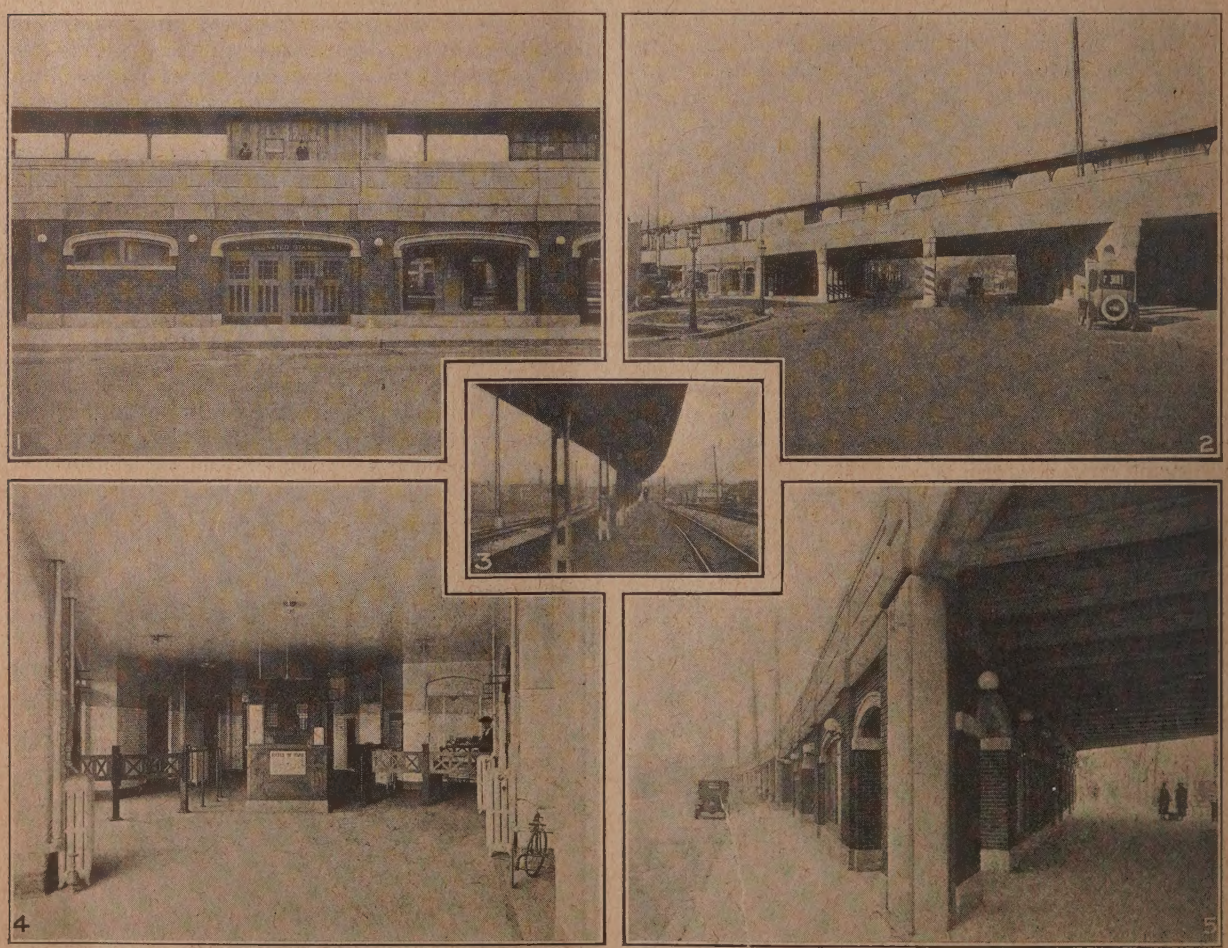
Pleasing Appearance of Stations Being Constructed on Elevated Portions of Chicago & Northwestern Are Helpful Toward Merchandising Service

THE accompanying pictures tell better than words can describe the story of the type of stations which are being built along the portion of the Chicago & Northwestern Elevated Railroad between Wilson Avenue and Howard Avenue, the northern city limits. This part of the road has been in the process of elevation during the past few years by the Chicago, Milwaukee & St. Paul Railroad, which owns the right-of-way. The construction is of the so-called noiseless type with concrete retaining walls on either side and earth fill between. The stations and facilities other than the actual right-of-way are being built by the Northwestern.

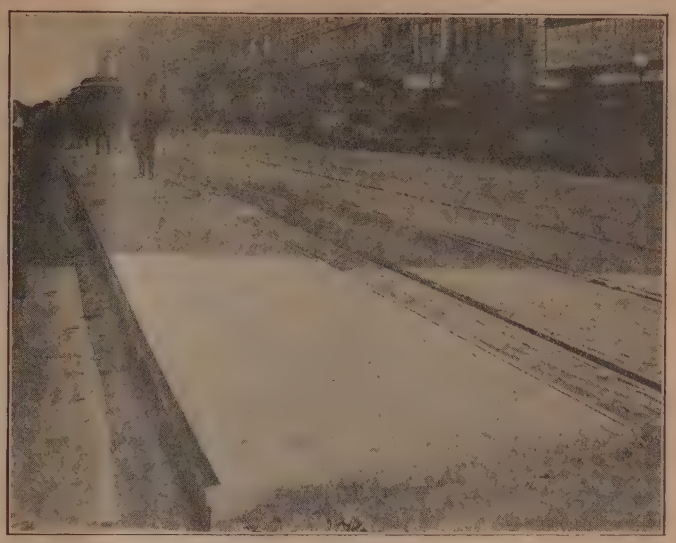
The particular station pictured herewith is known as Loyola and is located at an intersection of the line with Sheridan Road. The appearance, construction and general plan are typical of the stations that are being built along the line. The ticket booth is on the ground floor and one agent serves both directions of travel. Up on the right-of-way, the loading platform is of the center type located between tracks and with the roof supported on center columns.

Temporary wood structures are being used at most of the stations, but the permanent construction, as shown in the illustrations, is being put in gradually at one station after another as rapidly as finances permit. Similarly, work of putting the track and overhead construction in permanent shape is being gradually pushed forward. All of this extensive elevation work and the accompanying building of temporary and permanent stations have been done practically without a moment's delay to traffic or inconvenience to passengers. The fine facilities and conveniences that are afforded with the completion of these new stations are obvious and are a matter of very favorable comment from patrons, and undoubtedly have substantial merchandising value.

In one of the pictures it will be noted that the column which stands in the road has been prominently painted with black and white stripes and supplied with a night light to avoid vehicles running into it. This practice has been followed throughout the city as one of the safety measures of the elevated lines.



FIVE VIEWS OF THE CONSTRUCTION AND FINISH OF THE LOYOLA STATION ON THE NORTHWESTERN ELEVATED RAILROAD, WHICH ARE TYPICAL OF THE NEW STATIONS BEING BUILT IN CONNECTION WITH THE ELEVATION OF THE LINE FROM WILSON AVENUE, THE ORIGINAL TERMINUS, TO HOWARD AVENUE, THE PRESENT CITY LIMITS



TWO VIEWS OF ONE OF THE NEW LOADING PLATFORMS AT INDIANAPOLIS

City of Indianapolis Builds Loading Platforms

THE city authorities of Indianapolis, Ind., have apparently been convinced of the desirability and practicability of street loading paltforms for street car patrons. As evidenced by the two illustrations shown herewith the city is now building loading platforms at locations of heaviest loading in the center of the city.

The platforms are arranged for double berthing of the large double truck Indianapolis cars and are similar in many ways to those in Washington, D. C. They are constructed directly on top of the street paving and are made of concrete, with cement, or sidewalk, tops. A curb is not set, as has been done in other places, but a steel band is built into the edge of the platform and bears the brunt of any blows which may be received from passing vehicles.

It is planned to erect lighting standards at each end of the loading platform.

Two loading platforms were placed in service on Saturday, Dec. 3, and it is planned to build more of them in the future. The interesting feature of the present installation is that it is entirely a city inspired and city financed undertaking.

Tear Check Form of Transfer

The Use of a Special Cutter that Eliminates Hand Punching of Transfers When Issued Proves a Time Saver in Loading One-Man Prepayment Cars

A NEW type of transfer and transfer cutter has recently been developed and placed on all the cars of the Tri-City Railway of Davenport, Iowa. This new transfer was adopted to speed up the loading of the one-man cars. It has proved a great time saver and has overcome some of the many transfer abuses.

A separate and distinguishing color transfer is used for each line. The date, the lines on which it is good for fare and the condition under which it will be accepted are printed on the transfer. Although the month has to be punched by the operator, this can be done in large quantities when the operator is at leisure.

For convenience in making fare collections each car is equipped with a portable change box that has three compartments. It can be carried from one end to the other and is used to hold transfers received, tickets collected, cash for making change, etc. On the top of this box, as shown in the illustration, is placed a transfer cutter, made of $\frac{1}{8}$ x $\frac{1}{2}$-in. steel with one sharp edge, held down by a 1 x 2-in. steel roller, and thereby always gives uniform tension on the cutting edge. This cutter can be made at a small cost.

How the Device Works

On leaving the ends of the line the operator sets his pad of transfers, which have already been hand punched to indicate the proper month, under the cutter for the time of arrival at the transfer junction. All that is then required is for the operator to tear off the transfer and hand it to the passenger on request at the time fare is paid.

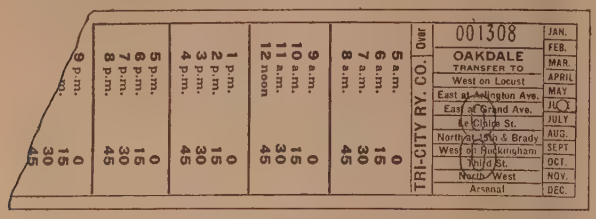
Old or late transfers are very easily detected by the receiving operator as the color shows the issuing line, and the length of the transfer greatly helps to detect one which is beyond the time limit. This obviously makes it easy for an operator to detect a passenger presenting a transfer in the afternoon that was issued in the morning.

The wastage of unissued transfers is cut down by having a daily supply issued with each car in the morning. The operator bringing in the car at night turns in all unused transfers. This plan cuts in half the number of partially used pads of transfers that no doubt would usually be thrown away.

As a means of keeping an accurate record of the transfers issued, special storage facilities were built

THREE COMPARTMENT CHANGE BOX WITH STEEL CUTTER MOUNTED ON TOP

with thirty-one shelves, one for each day of the month. Each shelf then was divided so as to hold a deck of a thousand transfers for each regular car run. These decks were numerically arranged and the lowest numbers always issued, with the result that when transfers are returned they can be placed on top of the deck



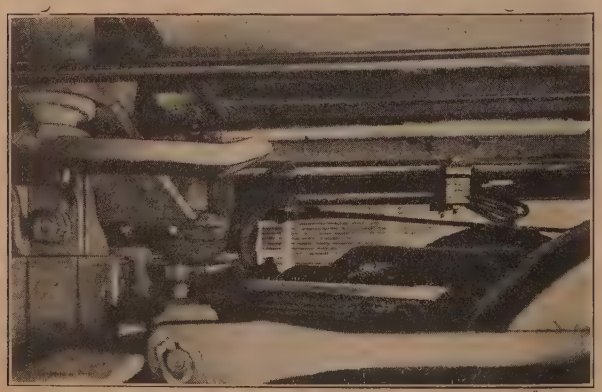
SAMPLE FORM OF ROUTE TRANSFER SHOWING HOW TIME LIMIT, MONTH AND DAY ARE INDICATED

from which they were taken and unless punched for the month can be reissued to the same car the following month. This plan makes the record keeping easy as the transfer stock is always arranged in consecutive numbers.

This system has been used for some time and has been found very economical.

Bringing Leads from Motor to Car Body

MOTOR leads and their proper installation play a very vital part in the successful operation of the car and in the reliability of the service rendered. Improper installation or inadequate attention to these details on many roads has caused much trouble, and inspection of some cars discloses the fact that the motor leads are lying on top of the motor shells in a disorderly manner so that they are subjected to unnecessary wear with every movement of the truck. Such wear soon injures the insulation and sometimes exposes the bare wire which results in a ground and failure, if not an accident. The use of tape on leads is but a makeshift for preventing failure and is not a satisfactory or safe method of repair. On some types of trucks the motor leads rub on the brake levers and truck rods. All these classes of failure can be materially reduced by a little attention to the method of bringing out the connections



CLEATING MOTOR LEADS TO CAR BODY

from the motor casing and in their arrangement as they are brought up to the car body. A liberal use of cleats will assist in this arrangement, and the leads should be brought out as close to the center line of the center plate as conditions will permit. This insures the smallest movement of the leads due to the swiveling of the truck on curves. The slack in the leads should be just sufficient to take care of the expansion and compression of the truck springs and provide for the movement on the shortest radius curve of the system. When this length has been determined the leads should be cleated to the motor shell or truck transom with wooden cleats supported on an iron bracket.

It has been found very desirable to have all motor leads of one standard length for all types. Some roads use a patented connecting box for their motor lead connections, but experience has shown that knuckle-joint connectors covered with fiber or rubber tubing give satisfactory results and they are much cheaper to install. An accompanying illustration shows an arrangement of motor leads and their method of cleating and attaching to the car body as used by the International Railway, Buffalo, operated by the Mitten Management Incorporated. The knuckle-joint connectors are placed between the two car-body cleats and are covered with fiber or rubber tubing to prevent short circuit or grounding from water or snow.

Handy Truck for Oxyacetylene Equipment

A HANDY truck for the tanks and equipment used in connection with an oxyacetylene cutting torch is shown in an accompanying illustration. This was built in the shops of the Portland Railway, Light & Power Company, Portland, Ore. The truck is made entirely of iron, the frame being of light angle iron with the ends forged round and bent to shape for handles. The tanks are held securely in place by two screw clamps, a flat iron strap extending across the two tanks, while the screw passes between the tanks and into the frame of the truck. The equipment is balanced so that one man can handle it very easily.

HANDY TRUCK MOUNTING FOR MOVING CUTTING TORCH

Injury and Damage Costs

FOLLOWING is a tabulation of the recent costs in per cent of gross income and per 1,000 passengers carried for the item of street railway expense covering injuries and damages as experienced by the companies operating in ten of the larger cities. This is seen to vary for the strictly surface line companies from a minimum of 2.92 per cent of the gross income to 7.14 per cent.

INJURY AND DAMAGE COSTS FOR VARIOUS COMPANIES.

Company	Peroid		Per cent of Gross Income	Cost per 1,000 Passengers Carried
Chicago Surface Lines	Year ended	1-31-21	3.28	$1.343
Chicago Surface Lines	8 months ended	9-30-21	2.92	1.314
St. Louis	10 months ended	10-31-21	6.00	2.72
Kansas City	10 months ended	10-31-21	3.34	1.705
Milwaukee (city lines)	Year ended	12-31-21	5.52A	2 35
Milwaukee (city lines)	10 months ended	10-31-21	5.94A	2.60
Philadelphia	Year ended	12-31-21	3.47	1.50
Boston	10 months ended	10-31-21	2.17B	2.13C
Third Avenue (N.Y.)	Year ended	6-30-21	5.00	2.78
Twin City	Year ended	12-31-20	3.83	1.57
Buffalo	10 months ended	10-31-21	6.22	3.45
Cleveland	10 months ended	10-31-21	7.14	3.08
New York Railways (S. L.)	Year ended	6-30-21	6.50	3.04

A — Per cent of operating revenue.
B — 28 per cent rapid transit car mileage.
C — For revenue passengers only.

Letters to the Editors

Further Comments on the Bus and "Bus Transportation"

IN THE issue of Dec. 10 some remarks regarding the extension of the service of ELECTRIC RAILWAY JOURNAL by the issuing of BUS TRANSPORTATION were given. It is believed that the following will also prove of interest in this line.

C. D. Emmons, president United Railways & Electric Company of Baltimore, Md., in discussing this question says:

"I saw an advance copy of your new publication, BUS TRANSPORTATION, and I then expressed my opinion that there should be a large field for such a journal.

"Undoubtedly, the bus is going to prove very useful in the question of transportation, and its economical usefulness must undoubtedly be in the hands of those operating the street railways themselves.

"It has been proved, I believe, in this country, and certainly in the cities and towns of England, that in order to have the best and most economical resultant transportation for their communities it is necessary to have them co-ordinated under one head, as the low rates of fare required by the public cannot support two systems, and thus ultimately the entire transportation mediums of the community become demoralized.

"I wish you much success in your new venture."

Edward Dana, general manager of the Boston Elevated Railway, writes as follows:

"I wish you to know that personally I am heartily in accord with your constructive step to create a forum, as it were, for the discussion of bus transportation whether by trackless trolley, gasoline motor, or however driven. I feel that you will perform a real service for the transportation industry.

"Personally I am glad that the association at this time did not permit a large influx of bus operators or interests into the association, as I do not think that the time was ripe. I do regret, however, that unnecessary feeling should have been aroused by this action, which is a perfectly logical one and does not, to my mind, indicate any lack of appreciation of the necessity for giving the bus its place in the sun, but is a business-like decision not to make a false move until more definite knowledge is had as to just what that place in the sun is. I can hardly conceive how any business interests or street railway operators can ever feel that the gasoline bus can take the place of the systems now devoted to mass transportation. It has already shown what it can do in smaller cities in the form of a guerrilla warfare, but the future, it seems to me, demands of us a conservative, intelligent study of all of the factors and an amalgamation of that which is economical, efficient and proper for bus service into a unified transportation system in order that cities may have the best possible transportation facilities. That information we have not at the present time. The bus can never do what the electric car did to the horse car, but there are many opportunities, as I see it, to create traffic in order that the load factor of traffic on existing trolley lines may be improved and new traffic served quicker than would be the case if it need wait for rail transportation. I feel it a great mistake for railway operators to classify the legitimate development of bus service in the same category as the ruinous jitney which has flourished over the past few years. The great need is to prevent false development and waste and to work along intelligent, comprehensive lines.

"If the bus has an economic field in conjunction with the rail systems, talk cannot stop its performing this function, and if it can only go so far in assisting local transportation, talk cannot put it any further."

James P. Barnes, president Louisville Railway, discusses the new publication as follows:

"I have carefully read the editorial in the ELECTRIC RAILWAY JOURNAL of Oct. 29 and my understanding of it is that the policy of publishing BUS TRANSPORTATION has been definitely decided upon. Any discussion on the publication of such a journal would therefore be purely academic. I shall of course be very glad to look over the new publication and to have it in our files for the usefulness of its subject matter.

"I would be the last to attempt to minimize the importance of the bus question to the transportation industry. I believe there is a very definite field of application for the motor bus, and perhaps for the trolley bus, and I believe most firmly that when the limits of that field are determined the existing transportation companies should be the operating agencies to take advantage of new facilities. All the information we can get about bus operation we should have, but we must not lose sight of the fact that the great bulk of our mass transportation will continue to be handled by the trolley car, rather than by the bus, as long as conditions continue substantially as at present. So much is being said and published about bus transportation that I think there is a tendency to regard the bus as a more far-reaching transportation agency than will eventually be found to be the case. We must learn and discuss all the features of bus operation and at the same time avoid the hysteria of overdiscussion or overemphasis. I certainly feel that no agency in the field is better able to hold its balance in those discussions than the editorial staff of the ELECTRIC RAILWAY JOURNAL and shall watch for the BUS TRANSPORTATION announcement with great interest."

From Cleveland, J. H. Alexander, vice-president the Cleveland Railway, writes as follows:

"I am very glad indeed to note the possibility of the new publication to which you refer in your letter. The development of the bus is something in which just now every one of us is keenly interested, and I am highly in accord with your view that such a publication is needed and will pay."

Comments have also come from the consulting engineers who are connected with the industry. T. Fitzgerald, consulting electric railway engineer of Pittsburgh, writes:

"I have enjoyed and gained a great deal of benefit from your present method of handling trackless vehicle material in the ELECTRIC RAILWAY JOURNAL.

"I have been wondering how you were going to cover the trackless vehicle field and thought maybe you would take the bull by the horns and change the name of the ELECTRIC RAILWAY JOURNAL in some way as to include

all of the matters vital to urban, suburban and interurban passenger and light freight transportation. Don't ask me for suggestions as to the proper name for such a journal.

"Your staff is undoubtedly the best equipped for leadership in the sound economic development of transportation methods in the field which has heretofore been looked upon as the electric railway field. There is no question in my mind about the necessity for including the trackless vehicle as a vital factor in the proper development of our electric railway systems.

"I react against the separation of these two fields, but if the separation must take place in order to bring about the co-ordinated development of both, it can best be done by having your present staff supervise both publications. Of course your activities in promoting the sound development of the trackless vehicle must be profitable and this may require a separate paper. If so, I am heartily in accord with the proposed plan.

"In our study of the freight situation here, bare possibilities of using trackless vehicles in conjunction with freight haulage by electric railways have arisen. Would you want to take into account such possibilities and name your new magazine so as to include any developments through which the activities of trackless vehicles and electric railways can be co-ordinated to provide better and cheaper distribution of materials?"

Edward A. West, general superintendent the Denver Tramway Company, writes:

"There is no doubt that bus transportation is here to stay, and there is no doubt that the McGraw-Hill Company, Incorporated, is eminently qualified, through its highly trained and efficient news-gathering and editorial staff, to prepare and publish a journal that will compass the ground covered by the auto bus.

"The advent of the trolley bus into the urban transportation field is due to there being a growing demand for that form of transportation, and it is my impression that a very rapid development of this type of transportation will be noted in the next few years. To my mind this fact makes it necessary that a competent organization handle the matter in an unbiased and broad-minded manner, and again I repeat that the McGraw-Hill Company is better qualified to do this than any other technical publishing house in the country.

"I could go on in this manner for an hour or so longer, but from the foregoing you will gather what my ideas are. In closing I can only say that if you people don't start handling this matter somebody else will, and as you yourself have put it, others might not have the interests of the electric railway people as much at heart as you have and advocate the application of buses to transportation business economically unsound."

In a letter from B. J. Denman, president Tri-City Railway & Light Companies, Davenport, Iowa, he says:

"With reference to the new publication BUS TRANSPORTATION, which you have announced, I will state that I believe it much better for the McGraw-Hill Company to start such a publication than to have it done by interests identified with the automobile business, as in that case the policy would be controlled from the commercial standpoint, rather than from the standpoint of the real economics of transportation. With the wide interest of the McGraw-Hill Company in utility companies in general, I feel quite sure that there would not be a serious conflict of editorial policy between BUS TRANSPORTATION and the ELECTRIC RAILWAY JOURNAL, and, as stated, unless you do start such a paper, some one else will surely do so.

"I have no question but that there is a field for bus transportation, supplementing existing transportation agencies, but this must be a supplemental service, and not a competitive service, unless the competition is put on a fair basis. The railways in small and medium sized communities cannot provide their track and pay for the paving and continue service in competition with buses which do not pay to the municipalities a compensation strictly comparable with that paid by the street railway companies, including general, city and county taxes, and paving taxes. The business must also be put on the same basis with respect to service requirements, and unless this is done the result will be the absolute destruction of the street railway business without building up a system which is equally satisfactory and reliable.

"The same thing is going to apply to the interurban and steam road competition, so far as the use of our improved highways is concerned. The present competition in some states is absolutely inequitable and unjust.

"From my knowledge of the policy of the McGraw-Hill Company publications, I will welcome its entrance into this new field."

Daylight Color Light Signals Installed in Liverpool

THE signal system of the Liverpool (England) Overhead Railway, which was the first elevated railway in the world to be worked electrically, has been re-equipped so that it is now the largest installation of daylight color light signals outside of this country. The new equipment was described in a recent issue of the *Railway Engineer*. At each station there is a home signal with an overlap of about 300 ft., the latter terminating just in the rear of the station. There is also a starting signal immediately at the outlet of the station and this also has an overlap of about the same distance. Even in the brightest sunshine the signal can be distinctly seen for 3,000 ft. The basis of the signaling arrangement was to allow for a two-minute service, although actually one of 100 seconds was provided for. The speeds were taken at 20 m.p.h. with an acceleration leaving the station at 0.75 miles per hour per second and a deceleration approaching the station of 1.4 miles per hour per second. Tests made showed that the overlap of 300 ft. was more than sufficient to stop a train in the event of an automatic application of the brake should a signal be over-run.

A Record of Sixty Years of Electrical Progress by English Paper

THE *Electrician* of London, which first appeared on Nov. 9, 1861, celebrated its diamond jubilee last month. In its sixty years of life it has recorded many epoch-making inventions and has seen the genesis of electric traction, electric lighting and the telephone and widespread adoption of the electric motor for industrial purposes. Its "diamond jubilee issue" contains congratulatory messages from Thomas A. Edison, Sir Oliver Lodge, Senatore Marconi and others. It also contains historical and technical accounts of the development of telegraphic and other applications of electrical energy to industry.

The New Jersey Commuter in New York Subway*

The Commuter Traffic to New York Amounts to 359,000,000 Passengers Annually and Is Growing Rapidly—Steps to Develop a Rapid Transit Plan Are Recommended

By Daniel L. Turner
Consulting Engineer to the Transit Commission of New York City

On every working day during the year 1920, from north, east, south and west, from as far away as 20 miles or more, and in the morning hours, nearly one and one-quarter million people were delivered into lower Manhattan by all of the rapid transit lines in New York and by all methods of commuter travel leading to the city. More than 200,000 of this traveling multitude were New Jersey commuters. This number is 17 per cent of all the travelers.

Although it is true that Manhattan is an island, the waters surrounding it have already been passed under by thirty single-track passenger tunnels and eighteen of these have been constructed by New York City. Therefore, physical barriers are no longer an obstacle to the realization of your aspirations for a more convenient transportation service between your homes and your work places in Manhattan. The difficulties are entirely political.

In order properly to emphasize the importance of dealing with our local transportation problem as a metropolitan rather than as a city problem, some figures will be given with respect to city transit and then with respect to commuter traffic.

The Enormous Traffic Increases in New York City

In the past the traffic on the street railway lines, subway, elevated and surface, in New York City, has nearly doubled every fifteen years. The average daily traffic on all lines is now more than 6,500,000 passengers.

The total traffic carried during the year of 1920 on all lines was approximately 2,365,000,000 passengers—approximately double the number of passengers carried on all of the steam railroads in the country. This was an increase over 1919 of nearly 285,000,000 passengers. Reduced to months, this means that during the average month in 1920, 23,000,000 more passengers were carried than during the average month of 1919; or reduced to days, it means that during the average day in 1920, 763,000 more passengers were carried than during an average day in 1919. Expressed in another manner, this means that on every day during 1920 nearly 4,200 more passengers were carried than on the preceding day—or it means that the equivalent of nearly four additional ten-car express trains must be added to the service every day to carry the increase in traffic each day.

In 1913, the year the dual contracts were signed, the rapid transit lines alone in Manhattan, the Bronx and Brooklyn—subway and elevated lines together—carried 810,000,000 passengers. In 1920 these same rapid transit lines, together with the new lines which had been placed in operation, carried about 1,332,000,000 passengers during the year. This means an increase of 64 per cent in seven years. It would have been utterly impossible to accommodate this enormous increase in traffic had it not been for the large additions to the transportation facilities which were opened for operation during the last two or three years. To keep pace with this enormous traffic increase, New York City must build more subways at once, and must formulate a plan for continuous construction.

Steam Railroad Commuters

The steam railroad commuters are assumed to include regular commuters, trip-ticket passengers and other short distance or suburban riders. In 1920, the total commuter traffic in and out of New York City was about 73 per cent of the total passenger travel on all steam railroads entering the city. It amounted approximately to 153,000,000 passengers. This number included passengers using the Grand Central terminal, the Long Island terminals and all traffic via the New Jersey roads. The total traffic or the commuter traffic and regular through railroad traffic together was about 210,000,000 passengers for the year. About 56 per cent of the total steam railroad commuter traffic, or about 87,000,000 in and out, used the New Jersey roads.

Neither the rapid transit traffic nor the commuter traffic is distributed evenly throughout the day. On the rapid transit lines, approximately 21 per cent of the total twenty-four-hour traffic in both directions is carried in three hours in one direction past the maximum load point. On the commuter lines, about 30 per cent represents the corresponding concentrated travel. The three heaviest traffic hours are either from 7 to 10 a.m. workward, or from 4 to 7 p.m. homeward. The real traffic problem is to take care of the traffic during these three hours morning and night. The daily steam railroad commuter traffic from New Jersey is approximately 272,000 and the daily rapid transit traffic approximately 4,162,000 passengers. Applying the preceding percentages to the daily traffic figures we find that the maximum daily traffic, one way, during three hours, from 7 to 10 a.m. or from 4 to 7 p.m., on all of the commuter lines together, amounts to about 82,000 passengers; on the rapid transit lines during the same three hours, the traffic is about 874,000 passengers. The ratio between these two figures is 1 to 10.7. In other words, during the one-way three-hour periods of greatest congestion, there is one steam railroad commuter from New Jersey for nearly every ten rapid transit passengers carried on the rapid transit lines.

Total Commuter Travel

The total commuter travel, including (1) steam railroad, (2) tunnel and (3) ferry commuters, aggregated approximately:

	Passengers
For the year 1920	359,000,000
For the day, both ways (478,000 + 115,000 + 528,000)	1,121,000
For the maximum three hours in one direction. (143,000 + 35,000 + 158,000)	336,000

Comparing this last figure with the 874,000 three-hour, one-direction, rapid-transit traffic, we have the ratio of 1 to 2.6. This ratio means that during the most congested three hours one way, the rapid transit travel is only a little more than two and one-half times the total number of commuters of all kinds coming into or going out of New York City.

In the case of New Jersey separately, there were 203,000 commuters during the maximum three hours in one direction. This gives the ratio of 1 to 4.3, as compared with the corresponding rapid transit traffic, or expressed in another way, during the maximum three hours in one direction there are nearly one-quarter times as many New Jersey commuters as there are rapid transit riders.

All of the foregoing figures are approximate, but they are sufficiently accurate to present the picture I have been endeavoring to portray, which is: That the importance of the commuter traffic with respect to the New York City transit problem cannot be overestimated.

The Commuter Terminals in New York

Of all the commuters, 336,000 in the maximum three hours in one direction, 10 per cent originate via the Hudson tunnels, 47 per cent via the ferries and 43 per cent over the steam railroads. Nearly one-half, or 46 per cent, of the steam railroad business passes into or out of the city through the Grand Central and Pennsylvania terminals in Manhattan and the Flatbush terminal in Brooklyn. This business amounts to approximately 66,000 passengers in three hours in one direction. These terminals also accommodate 120,000 through passengers in both directions daily. However, the through passengers are distributed throughout the day and therefore do not impose a heavy burden on the terminals. But from the preceding figures it appears that there must be taken care of through the three terminals in three hours in one direction more than one-half as many commuters as there are through passengers traveling in twenty-four hours in both directions. The concentration of commuter traffic at the Grand Central, Pennsylvania and Flatbush terminals, therefore, is the real passenger problem which the railroads have to contend with. This concentration of travel amounted to 21,000 passengers at the Grand Central Terminal, 22,000 at the Pennsylvania, 23,000 at Flatbush and 35,000 at the Hudson & Manhattan terminals.

Many of these people walked to and from the terminals but a large proportion of them used the subways. In the morning the subway trains coming workward are carrying their maximum loads when they reach the terminals, so that passengers have to struggle to get aboard. This delays the trains and reduces the capacity of the subways. At night, returning passengers almost have to fight their way out of the trains. The introduction into the subway of such a large volume of traffic at already congested stations is disastrous to service. It is most important to eliminate such conditions wherever possible.

But this is not the worst of the situation. The commuter traffic at the terminals is growing at a terrific rate. During the last ten years it has increased about 117 per cent at the Grand Central. During nine years the Long Island commuter traffic has increased 141 per cent at Flatbush and 275 per cent at the Pennsylvania Station. The

*Abstract of paper read at the Bi-State Rapid Transit Conference under the auspices of the City Plan Commission, held at City Hall, Paterson, N. J., Dec. 15, 1921.

capacity of the Flatbush terminal has practically been reached.

The Pennsylvania Station has really become a Long Island terminal, since two-thirds of the business through it is Long Island business, and also since the Long Island Railroad used it for 40 per cent of its own business coming into the city. The Long Island Railroad is operating from the terminal under a two-minute interval service during the rush hours. At this time the terminal has nearly reached its capacity to Long Island. It is all due to commuter traffic. Here we have a terminal only eleven years old, and it has become so seriously congested that steps are being taken to determine what can be done to relieve the situation.

The New Jersey commuter traffic has increased also but not as rapidly as the Long Island, Westchester and Connecticut traffic. The commuters on the New Jersey Central, Lackawanna and Erie increased approximately 40 per cent during the last ten years.

CONCLUSIONS

The foregoing figures are important in that they all point in one direction. They emphasize the fact that the commuter traffic has really become a very great factor in our urban transit problem. They also emphasize the fact that the commuter traffic is increasing at a terrific rate. The growth of the traffic is so stupendous that the consequences will be very serious if immediate steps are not taken to deal adequately with the problem. The commuter service must be transformed into a metropolitan rapid transit service. The only difference now between our city rapid transit and this metropolitan rapid transit is that the latter requires a longer haul and operates both inside and outside of the city limits. The metropolitan service is even now operated on an interval basis, as instanced in the case of the Long Island Railroad. All of which means that a Metropolitan transit plan must be developed.

Commuters, under the proposed new order of things, should be brought into and distributed through the business center of the city as far as it is practicable to do so. At least they should be brought to points where by easy transfer from one line to another they may reach almost any objective point within the city. Commuters should not be delivered to terminals. The commuter does not need a terminal any more than a city rapid transit rider does. He only buys a ticket once or twice a month, he has no baggage to check. He does not desire to wait for trains. He expects frequent service amounting almost to interval service and times his movements so as to make quick connections. So what the commuter requires is a frequent, quick, regular and through service from his home to his work and back again with the minimum amount of transferring in transit.

The underlying principles of a suitable plan to accomplish this are briefly: there must be a pooling of railroad interests, an extension of electrification, additional tubes must be constructed under the Hudson and East Rivers, the commuter lines themselves must be articulated together so that a more convenient interchange of traffic between them can be effected and the commuter traffic must be carried into and distributed through the business center.

It has been suggested that the Port Authority might be utilized as the agency to develop such a plan, but I do not believe the law is broad enough to permit this. The functions of the Port Authority are restricted to a freight project. Similarly, the Transit Commission in New York is without power to deal with the question. Its activities, by reason of the political division of the Metropolitan area already alluded to, are restricted to the territory east of the Hudson. Consequently all of its efforts have been directed toward developing rapid transit facilities for New York City exclusively.

A new agency must be created, but it is believed that another interstate authority would be a mistake at this time. It is suggested that the best and quickest way of dealing with the situation is to create a New Jersey Transit Commission with all the necessary authority to study the question of interstate transportation of passengers and to develop the necessary plans to effectuate such a project. Such a New Jersey commission would undoubtedly receive the hearty co-operation of the Transit Commission of New York to the end that its plans might properly conform to the city's new transit plan.

In any Metropolitan transportation project, either for freight or for passengers, in the interests of economy the existing New Jersey and New York railroad facilities must be utilized to the greatest extent possible consistent with the best development of a plan. The same railroads are involved in either case. Therefore the freight plans and the passenger plans must both fit in with the existing railroad conditions, and also must fit in with each other. Consequently, when the construction of the project is to be begun, it will be a great advantage to carry out the work under the same authority. Under such circumstances, since it is already vested with power to carry forward its freight project, the Port Authority would seem to be the natural agency to undertake the combined project.

In the interim, while the New Jersey Transit Commission is developing the plans, the feasibility of the suggested method of procedure can be resolved.

American Association News

Mid-Year Conference Plans

Tentative Program Includes Discussion of Matters of Interest—Notable Speakers for the Dinner

THE committee on subjects of the American Electric Railway Association, C. D. Emmons chairman, has announced the following tentative program for the Mid-Year Conference at Indianapolis on Feb. 28. The meeting and dinner will be held at the Claypool Hotel.

PROPOSED PROGRAM

Morning Session, 10 a.m.

1. Opening Address of Welcome by Governor McCray, of Indiana.
2. The Co-ordination of Trackless Transportation in the Future Service of the Electric Railway Industry.
   This discussion will be started by the following four speakers:
   (a) "City Service and English Conditions," C. D. Emmons.
   (b) "Co-ordination of Service, the Unified System," E. B. Whitman.
   (c) "The California Situation," Paul Shoup.
   (d) "From the Interurban Viewpoint," Harry Reid.
   Discussion.
3. Report of special committee on co-operation of manufacturers in the interest of electric railways, presented by E. F. Wickwire.
   Discussion.

Afternoon Session, 2 p.m.

4. Address by J. W. McCardle, chairman Public Service Commission of Indiana.
5. Drill of the Chicago Elevated Safety Team, preceded by explanation of the purpose of the organization, by B. I. Budd.
6. "Unfair Taxation Burdens on the Street Car Riders and How They May Be Eliminated," by Fielder Sanders, Street Railway Commissioner of Cleveland.
   Discussion.

Evening Dinner, 6:30 p.m.

7. Introductory address of President R. I. Todd.
8. Address on "Public Relations," by Samuel Insull of Chicago.
9. Address on "Private vs. Public Ownership of Public Utilities," by Carl B. Jackson of the Wisconsin Public Utilities Commission and president of the National Association of Railway and Public Utility Commissioners.*
10. Address, by President Harding.

Attractive entertainment features will be interspersed with the above.

The Special Dinner Committee, Harry Reid, chairman, has announced the following chairmen of its sub-committees. The Regional Representatives of the Transportation committee were announced in last week's issue.

Seating Arrangements — J. P. Barnes, president Louisville Railway, Louisville, Ky.

Entertainment — Harry Reid, president Interstate Public Service Company, Indianapolis, Indiana.

Ladies' Committee—Mrs. R. I. Todd.

Transportation—H. J. Kenfield, president *Electric Traction*, Chicago, Ill.

Publicity — Myles B. Lambert, manager railway department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Reception — S. W. Greenland, vice-president Indiana Service Corporation, Ft. Wayne, Ind.

Christmas Cards to Committee Members

PRESIDENT L. H. PALMER of the Transportation & Traffic Association sent during the past week to each committee member of that association a card bearing the following sentiment: "The momentous conference in our capital is striving to make real for all the world the peace of Christmas. So this year it is peculiarly fitting that the president and the executive committee of the Transportation & Traffic Association send you, with their hearty Christmas and New Year's greetings, the earnest hope that you will do your part in the work of our committees. Thus will you help our industry to be a factor in the return to normal business relations to a world at peace." The card, so far as its mechanical features are concerned, was got up by the Collier Company.

* Mr. Jackson has been invited, but his acceptance has not yet been received.

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

California Commission Reports

San Francisco and Los Angeles Valuations Among Outstanding Features of Work of That Body

The peak in public utility rates has definitely passed and a substantial decline has set in, the State Railroad Commission of California announced on Dec. 12 in giving out a letter to Gov. William D. Stephens, transmitting its annual report for the year ended June 30, 1921. It pointed out that in the year covered in the report material reductions were made in gas and electric rates, and the commission adds that there is every reason to hope that the trend of prices toward normal will make further reductions possible.

The commission declares that the advance in utility rates during the war and the reconstruction period was relatively small as compared with soaring commodity prices, and in this connection says the contrast between regulated and unregulated business is illuminating and "of itself would be sufficient justification, if justification were any longer needed, for the enlightened policy of state regulation." It is shown that if public utility rates had been advanced equally with commodity prices, the people of the state last year alone would have paid in the neighborhood of $100,000,000 more than they did to the public utilities.

Regulation Not a Hindrance

In discussing rate reductions and rate investigations under way, the commission informs the Governor that a basis for rate adjustments will soon be established for all the large power companies of the State. This will mark another definite advance in the program of effective regulation, the letter says.

The assertion that regulation tends to hamper industry is declared by the commission to be a fallacy, and it points out that the public utilities under regulation are keeping pace with the rapid growth of the State. This is especially true in the development by the power companies of the hydro-electric resources of California's mountain streams.

The letter reviews the legislative investigation of the commission, declaring that the Inman committee performed a valuable public service in correcting certain popular misapprehensions as to the procedure and rulings of the commission. The two most widespread errors, the commission declares, were that it allowed returns on capitalization and that it was restricted in its investigations by rigid court rules. On the contrary, it is shown, the powers conferred on the commission give it a large latitude of initiative and independent research.

The letter reviews in detail the work of the commission, which has doubled in the past two years, and discusses also the financial status of the utilities.

In addition to the work in connection with other departments, the engineering department of the commission completed two notable valuations—those of the United Railroads, San Francisco, and of the Pacific Electric, Los Angeles. The valuation of the United Railroads was made in connection with the application of the utility for approval of its reorganization plan. The reproduction cost new, less depreciation of the system was placed at $41,000,000. In this connection it may be stated that the inventory prepared by the engineering department was used as a basis in the subsequent valuation made by the city of San Francisco and an engineer from the commission assisted by the City Engineer's office in the work. The results obtained closely approximated each other.

The valuation of the Pacific Electric Railway was the most extensive piece of work of its kind ever undertaken by the engineering department. Begun in June, 1919, it was completed near the close of the present year. Findings were made of the historical reproduction cost new and the reproduction cost new. With a condition per cent determined the cost less depreciation was arrived at for each valuation. The historical reproduction cost was found to be $71,194,759, and less depreciation $56,372,096.

Complementary to the valuation report an exhaustive survey was made of the service conditions obtaining on the system, including an analysis line by line of the entire system, with a discussion of revenues, expenses and operating schedules. Containing many suggestions designed to overcome present financial difficulties, the report also looked to the future and proposed means of meeting in permanent fashion growing problems of traffic congestion. In this connection the recommendations made in the terminals cases were repeated and emphasized. Made a part of the survey was a special study of automobile transportation and the suggestion offered that the choice between trolley and motor transportation facilities must ultimately be made by the people and the communities affected.

Other service reports, including valuations, were made on the Sacramento, the San José and the Peninsular electric lines.

W. C. K. Alumni Association Formed

One hundred and forty former employees of Westinghouse, Church, Kerr & Company met on Nov. 30 and organized the "W. C. K. Alumni Association." The object of the association is the maintenance of the friendships formed by the members during many years of service with Westinghouse, Church, Kerr & Company. The periods of this service run anywhere from three years to twenty-five years, three years being the minimum requirement for membership.

The secretary, A. H. Tummel, 131 Warwick Street, Brooklyn, N. Y., will be glad to hear from any former employees who are desirous of joining the association.

Bus Regulatory Ordinance Passed

City and Railway at Des Moines Start to Put Into Effect Provisions of New Franchise Grant

The City Council of Des Moines, Ia., during the week ended Dec. 24 sounded what is thought will be the death knell of the buses when an ordinance was passed setting out the routes which buses must use if they are to continue to operate. The ordinance practically eliminates buses from streets where electric railways operate and to a very large extent from the loop district of the business section.

Buses Must Respect Ordinance

Bus men who appeared before the City Council protested that bus provisions were not regulatory but meant complete elimination. Arguments against the routes were made by Charles W. Lyon, attorney for the bus men, and B. Frank Prunty, a suburban banker who has become financially interested in one of the larger bus companies. The City Council refused to rescind its action and the bus men are now holding almost daily conferences to determine whether or not they will attempt court procedure to protect their rights.

One of the provisions of the routing against which the bus operators make their chief complaints is forcing them off the Seventh Street viaduct for the Ft. Des Moines and Sevastapol lines. This was one of the conditions sought by the Des Moines City Railway and the business men's committee which advised the City Council. F. C. Chambers, general manager of the Des Moines City Railway, agreed to station a flagman at the railroad crossings which the bus men will be forced to use in the event that they cannot run over the viaduct.

Although the new ordinance has been published and is, therefore, nominally in effect no actual effort has been made yet by the city to force the buses from the routes they have been using, but action looking toward this end is expected within the next few days.

As a matter of fact the City Council delayed for more than a week passing the ordinance on the basis of the agreement which it made some time ago that the buses would be regulated as soon as the Des Moines city railway had placed thirty additional cars in service. For nearly ten days the railway has been operating ninety-two cars, which is more than the number specified by the Council.

Appeal to Be Heard Jan. 13

The Iowa Supreme Court has set Jan. 13 as the date for hearing the appeal made by the city on the decision of Judge Hume of the Polk County District Court, which granted the North Des Moines Improvement League's petition for a temporary injunction restraining the franchise election. It is now thought that the Supreme Court will handle the appeal before Judge Hume rules on making the injunction permanent.

Service-at-Cost Idea Sound

Cleveland's Street Railway Commissioner Reviews His Six Years in Office—Says Franchise Has Proved Elastic Enough to Work Under All Conditions

Fielder Sanders, street railway commissioner of Cleveland, Ohio, has reported to the City Council an account of the accomplishments under service-at-cost in that city. The report is dated Dec. 14. It covers the entire six years during which Mr. Sanders has held office. The document is especially significant because of the great interest in the service-at-cost plan in Cleveland, because of the historical facts enumerated by Mr. Sanders, because of the recommendation that the Cleveland Railway use buses and because of Mr. Sanders' advice that the company attempt to collect back income taxes which it has paid.

ACCORDING to Mr. Sanders the real outstanding development of the last six years is the complete demonstration of the soundness of the underlying principles of the Tayler grant. He says that the franchise has proved elastic enough to work under all sorts of conditions, has kept the railway and its administration out of political campaigns, has carried the company successfully through unusual adversities and has also protected the public. Credit is given by Mr. Sanders in these words:

> Your honorable body is entitled to much credit for the manner in which emergencies have been met and for the readiness with which you have raised the rate of fare and granted the company relief when necessary. The public of Cleveland is entitled to much credit. The car riders have demonstrated their confidence in the Tayler grant by their continual co-operation by riding, by paying increased rates without objection and by their steady support of the company and the city.

Remarkable Changes Since 1916

Mr. Sanders says that the years since 1916 have been marked by striking events and remarkable changes. During that time the city of Cleveland has increased in population from 700,000 to 850,000 and the Cleveland Railway system has increased from 288.6 miles of single track to 303.6 miles. More than 102 miles of track have been removed, 281 new passenger cars have been added and 167 old ones retired, a net increase of 114 cars. The gross income of the company has been $83,435,960. It has spent for maintenance, depreciation and removal of track and equipments $17,330,378. In the six years property to the value of $3,839,924 has been retired on account of obsolescence, the reproduction value thereof paid for out of the earnings and the proceeds thereof used for the acquisition of new property.

Particular attention is called by Mr. Sanders to the fact that the operating allowance of the Cleveland Railway has been increased from 12.6 cents to 26 cents per car-mile; the maintenance depreciation and renewal allowance from an average of 4.9 cents to 12 cents per car-mile. Notation is also made of the fact that the motormen and conductors' wages have been increased from 29 cents an hour during the first year and 32 cents an hour thereafter, to the present rate of 55 cents an hour for the first three months, 58 cents the next nine months and 60 cents an hour thereafter, reaching the highest point of 70 cents, 73 cents and 75 cents an hour in the period between May 1, 1920, and May 1, 1921. In addition extra compensation for unusual working conditions, and a six-hour minimum day have been put into effect. The rate of fare has increased from 5 cents with a 1-cent charge for transfer to the present maximum rate of the franchise, 6 cents cash fare, nine tickets for 50 cents with 1 cent for transfer, or from an average fare of 3.417 cents in 1916 to 6.03 cents in October, 1921.

Power Contract Fortunate

Mr. Sanders next reviews the trying conditions imposed on the railway of war-time operation and changed economic conditions and says:

> The Cleveland Railway, due to its careful management, to the co-operation of the city, the confidence of the people, and the peculiar provisions of its franchise has been enabled to operate successfully, render adequate service to the public at as low a rate of fare as there is in the United States and maintain its property in such shape as to place it now in a position to continue its public duty successfully and this notwithstanding that the period of high prices, inflated values and heavy traffic during the war has been followed in the year 1921 by a depression and falling off of traffic such as to cause the gravest apprehension.

According to Mr. Sanders the railway was particularly fortunate in contracting with the Cleveland Electric Illuminating Company for power, in furtherance of which plan the largest single piece of property of the company, the Cedar Avenue generating station, producing power at an excessive cost, of the value of $1,265,585 was scrapped and written out of the capital account. Mr. Sanders estimates the total savings of the power scheme as now in force as compared with the old one in 1916, have been more than $2,000,000 in the last four years in the price of power alone, disregarding altogether the saving in copper cables, the gain in the transmission of power short distances and the increased operating efficiency of the cars through high voltage.

Modified Zone System in Use

Of the modified zone system put into effect in the downtown district, July 10, 1921, lasting fifty days, with a 3-cent cash fare, two tickets for 5 cents, Mr. Sanders says that when the experiment was made traffic was falling off decisively; there was no pleasure riding of any kind and economic conditions were such that the unnecessary spending even 3 cents was a matter of considerable importance to a great number of the car riders. He suggests that this matter be carefully studied with a view to further trial under more favorable conditions.

The tremendous growth in the number of automobiles and other causes have increased the amount of money paid out as expense of operation in payment of personal injury claims and property damaged from $575,795 in 1915 to $1,320,179 in 1920 and $1,050,155 for the first ten months of 1921. On Sept. 6, 1918, the commissioner wrote the railway suggesting that it establish as a part of its organization a department with its necessary personnel to have sole charge of the task of preventing accidents. In response to that letter, the railway first, through its operating department, tightened up its discipline with the idea of making the men more careful. This not proving as successful as anticipated, the railway then installed a complete and scientific school for its new motormen and conductors in which the men were given a long course of training, not only in the operation of cars but in the prevention of accidents before being sent out on the road. Finally, in addition to these methods, the company has now established, by way of an experiment, a special department with a separate department head who is charged with the duty of doing all that is humanly possible to prevent accidents of all kinds on the system. As a result of the co-operation of all the interests concerned this department is working out with a very great degree of success.

On the matter of tax recovery Mr. Sanders says:

> The expense by way of taxation has been assessed against and paid by the Cleveland Railway in the last few years, which in my judgment is wholly unjust. This is the matter of the federal income tax. The United States Government for some years past, has collected an income tax of 10 per cent on net earnings of corporations. Applying this income tax law to the Cleveland Railway, the return of whose stockholders is limited, exactly as to a corporation with unlimited returns, the federal government has collected from the Cleveland Railway the sums of $344,337 for 1918 tax, $392,038 for 1919 tax, $74,000 for 1920 tax and $255,400 for 1921 tax. These sums have actually been paid by the car riders out of their own money. That part of this money upon which this tax has been levied, which is in excess of the amount required for the return to the stockholders, has been in no sense an earning of the corporation. It cannot keep it for itself or for its stockholders. Under the ordinance, it gets this money only as a trustee for the car riders.
>
> As the money accumulates it is the company's obligation to hand it back to the car riders, either in reduction of fares or in increased service. The underlying idea of the grant is service-at-cost. If service-at-cost could be exactly, mathematically carried out, so that the car rider pays the exact cost of his ride on the day that he rides, this tax could not be assessed because there would be no surplus accumulated. The fact that this is impossible, since there must be from time to time a surplus in the interest fund so as to regulate the fare over periods of time, is seemingly no reason why the patron, the car rider, should be fined 10 per cent of his own money, trusteed to the company for his benefit, under a law which is intended to tax only the income to the owners of the property.

As a result of his study of this matter Mr. Sanders has recommended to the Council that every effort should be made to present this situation to the federal authorities on behalf of the city of Cleveland and its car riders to secure relief for the future and if possible a refunding of the sum paid in the past.

The opinion of Mr. Sanders is that the size of the city necessitates an immediate attempt to supplant or supplement the surface cars by some faster form of transportation. He says:

> Even if confined to transportation on the ground, it is a fact that many people prefer automobile or bus facilities to street cars. Other cities, notably New York, Detroit and Baltimore are recognizing that fact at the present time. I am wholly of the opinion that when these new forms of transportation, bus, subway, elevated or otherwise, are added that they should be operated by the Cleveland Railway or its successors, under the same close city control as at present, so that the car riders may have a uniform transportation system, which we can watch. I believe that within

the very near future, the Cleveland Railway, whenever it can increase its capital stock, should recognize the preference of the people and should establish at least bus line transportation itself at such rates as Council may permit.

In carrying out the city control of the railroad service and of its expenditure under direction of the Council Mr. Sanders expended the following amounts:

Year	Amount Expended	Amount allowed (1% of operating allowance, excluding extensions)	Surplus
1916....	$27,770	$44,927	$17,148
1917....	30,181	51,942	21,761
1918....	34,595	64,302	29,707
1919....	48,045	76,770	34,725
1920....	53,254	103,398	50,143
1921....	55,110	95,868	40,757

Mr. Sanders deplores the fact that the very difficult task of securing new money so as to enable the company to carry out its public duty remains unsolved. He regards this as the first of the two great problems not yet settled, despite the efforts of the administration to accomplish this settlement. The second of these he sees as the great need for rapid transit. For this reason, beginning January, 1917, and continuing until the present time, Mr. Sanders has spent a great part of his time outside of the routine duties in an attempt to secure rapid transit. He says:

A Rapid Transit Commission, of which I was a member, aided by expert advice of outside engineers, and the faithful work of the assistants in this office, developed a scheme of downtown terminal subways and recommended to the Council and to the people their building, at an expense of $15,000,000, by the city but to be operated by the Cleveland Railway. The results of three years' study, submitted to the voters of Cleveland in April, 1920, were not approved; whether because of the financial situation or otherwise, is not important to discuss at this time. They would have relieved the paralysis now increasingly apparent in the operation of surface cars through the congested district.

Efforts were continued, notwithstanding, to improve the existing facilities. Several lines were rerouted and more cars turned away from the congested district by new loops. A proposition was also presented to the Council to cut some of the long lines, but after much discussion by the Council, it was agreed that the action was too radical, although it promised advantages.

In conclusion Mr. Sanders says that with better industrial conditions now appearing probable for the immediate future Council should take up these two great problems—enable the railway to finance—enable it to expand and give the people the rapid transit so essential to Cleveland.

New Wage Scale in Effect in Fresno

A new pay schedule for trainmen of the Fresno (Cal.) Traction Company went into effect on Dec. 1.

Following are the new and old rates of pay in cents an hour:

	Old Rate	New Rate
First year	51	47
Second year	52	48
Third year	53	49
Fourth year	53 plus $5 per month—bonus	51

In addition to the above rates, the annual twelve days vacation with full pay, which is equivalent to approximately 2 cents an hour, will be continued.

Four cents an hour in addition to the above scale allowed for one-man car operators.

The bonus payments will be discontinued.

Establishes Pension System

Eastern Massachusetts Street Railway Will Provide for Employees Serving Twenty Years or More

By the unanimous vote of its board of public trustees the Eastern Massachusetts Street Railway, Boston, Mass., has adopted a system of pension for its employees, to go into operation on Jan. 1, 1922, under which employees who already have reached the age of seventy years will be retired on that date. The employees will not be required to contribute toward the plan. The terms of the plan, as announced by the trustees, are as follows:

Eligibility for a pension will be determined by the age of each employee and the years of continuous service with this company or any of its predecessors.

Employees who have been in the service of the company twenty-five years or more who have reached the age of seventy will be retired on Jan. 1, 1922, and become entitled to a pension.

In order to take care of special cases, the pension board may, in its discretion, retire with pension any employee sixty-five or more years old who has been in the service of the company twenty years.

No provision has been made for disability pension, but the public trustees recognize that particular instances may arise meriting consideration and action.

Payments will be based upon the following schedule:

For twenty years of service, $35 per month or $420 a year.

For each additional year there will be added $1 a month or $12 a year, so that the pension will be, for example:

	Month	Year
25 years continuous service.	$40	$480
30 years continuous service.	$45	$540
35 years continuous service.	$50	$600
40 years continuous service.	$55	$660
45 years continuous service.	$60	$720
50 years continuous service.	$65	$780

The pension board, appointed by the public trustees, is composed of three trainmen of the company, one general foreman, one track foreman, one public trustee, and R. B. Stearns, vice-president and general manager of the company.

$89,825 in Bonus Money Awarded

Christmas bonus amounting to $89,825 was paid by the Los Angeles (Cal.) Railway to 1977 trainmen on Dec. 15. The payment was made under the merit and bonus system operated by railway since April 1, 1920. The full bonus is $60 on a basis of $5 a month. Records are kept from Dec. 1 so that ratings may be checked up and bonus awarded just before Christmas.

Special prizes were awarded seventy-seven trainmen. The extra awards ranged downward from double bonus and were awarded the seven most efficient conductors and motormen at each of the company's five divisions. From the list of 105 safety car operators, the seven most efficient men were selected and received similar awards. In selecting the men for the special efficiency awards the company took into consideration not only the actual percentage ratings but such points as personal appearance, promptness in reporting for duty and making written reports where necessary, uniform safety and courtesy records and willingness to help new men.

When a trainman has been in service six months he is entitled to participate in the merit and bonus system. His record starts with 100 per cent and he is then subject to credits or demerits, five points counting as 1 per cent. Credits are given for acts of special efficiency outside the usual line of duty. Ten credits are given for a clear courtesy record for a month and a like award is made for a clear safety record. Acts noted by supervisors, officials of the company, by passengers who communicate with the main offices or by trainmen themselves bring credits.

Demerits are given for such causes as failure to make relief, dangerous operation, discourtesy, inaccurate reports, untidy appearance, etc. If a man brings his efficiency rating below 75 per cent he is discharged automatically.

The railway considers that the bonus awards are not mere Christmas presents, but represent payment for specially efficient service rendered the company and the public.

Sault Ste. Marie Differences Adjusted

The department of Labor of Ottawa, Can., has received the unanimous report of the Board of Conciliation, which has adjusted differences between the International Transit Company, Sault Ste. Marie, Ont., and some of its employees.

The document recommends the recognition of the union, a nine-hour day and a wage award of 40 cents an hour, increasing at the rate of 1 cent an hour each six months with 45 cents after two years' service.

Ten Per Cent Wage Cut on Boston & Worcester Property

The board of arbitration recently reduced the wages of the employees of the Boston & Worcester Street Railway, Boston, Mass., 10 per cent, the reduction being retroactive to Sept. 1. The maximum rate for the blue uniform men was 60 cents an hour, and therefore the maximum rate for these men is now 54 cents. All other schedules of wages were reduced 10 per cent. The old and new rates of pay in cents per hour for the blue uniform men are as follows:

	Old Schedule	New Scale
For first three months..	50½	45½
For next nine months..	52	47
After first year.....	60	54

The award recognizes that the company is entitled to a further reduction next year, if the cost of living is not increased. The company did not ask for a cut of 10 cents an hour. It offered to pay 53 cents for the maximum blue uniform wage without arbitration.

Jamestown Wages Cut Nine Cents

The Jamestown (N.Y.) Street Railway, on Nov. 16, put into effect an approximate 9-cent reduction in the wages of conductors and motormen. The former and present wage scales in cents per hour are as follows:

	New Scale		Old Scale
First six months.....	36		45
Second six months.....	38		47
Second year.....	39		49
Third year.....	41	Two years	
Five years and above....	43	and above	50

Employees of the Chautauqua Traction Company and the Jamestown Westfield & Northwestern Railway are included in the 9-cent wage cut. Announcement of the reduction was made by A. N. Broadhead, president of the three lines.

New York Commission Prepares for Valuations

Bus Accident Data, Power Costs, Queens County Lines and Municipal Operation in the Grist Last Week

Late during the week ended Dec. 24 the New York Transit Commission adjourned its hearings until after the first of the year, when the chairman announced that valuations would be taken up. A portion of the testimony on Dec. 20 and that on Dec. 21 was presented too late to be reported in last week's issue of this paper. The greater part of the late testimony on Dec. 20 related to statistics of bus accidents in New York and repair maintenance by the New York & Queens County Railway.

COUNSEL SHEARN GIVES SOME FIGURES ON JITNEY BUS ACCIDENTS

Following the presentation of the proposed rerouting plan of Daniel L. Turner, Counsel Shearn said that he thought it would be desirable to gather evidence on the number of accidents which the jitney buses in New York had had since they had been placed in operation in November, 1919. The work of gathering these data has been difficult, he said, because it has been the policy of the Police Department, acting under orders, to refuse all access to the police blotter records which set forth the troubles of the jitney buses. Mr. Shearn said he had done as well as he could, however, by having recourse to newspaper reports of accidents and reports turned in by the surface lines of collisions with buses, etc. He then first submitted what he called "an incomplete and imperfect" record of jitney bus accidents in Manhattan from Sept. 23, 1919, to June 26, 1920, made up from records of collisions between buses and cars of the New York Railways Company. These records showed 148 accidents, with personal injuries in thirty-four and in all but one some property damage. In addition he presented a tabulation made up from notes published in the *Brooklyn Daily Eagle*, from Nov. 7, 1919, to Sept. 7, 1921, showing a total of eight persons killed and 298 injured in accidents to jitney buses. He suggested that it would be well for the commission to summon the owners or operators of these bus lines and ascertain whether they have paid anything to the injured persons, what they have done in the way of upkeep of their cars and similar data.

The Fifth Avenue Coach Company then submitted statistics of its accidents. These figures showed that during the period from Jan. 1, 1919, to Dec. 18, 1921, there had been no one killed, six persons were injured seriously and thirteen persons suffered minor injuries. From 1907 to date, or during fourteen years, the company has operated 64,000,000 miles and has had only two turnovers.

Reuben E. Fielder, mechanical engineer of the Fifth Avenue Coach Company, was then questioned about the design of the Fifth Avenue buses. This testimony was introduced because of an alleged statement by the Mayor that the Fifth Avenue buses were unsafe. Mr. Fielder testified that in the model L bus the center of gravity, when the bus is fully loaded, is about 52 in. above the ground. In the model A, which is an earlier design, the distance is 73 in. The greater part of the equipment now is model A, but model L buses are being put on. When asked about a bus operated by a different company in another part of the city he said he thought this bus had a center of gravity about 100 in. above the ground.

Charles E. Chalmers, receiver of the Second Avenue Railroad, was then recalled to give information in regard to the charges for power paid by that company to the Interborough Rapid Transit Company and New York Railways. It developed that when the Second Avenue Company was part of the Metropolitan Street Railway system it had contributed $750,000 to the construction of the power station of that company at Ninety-sixth Street, with the understanding that thereafter it was to get power at cost, but when the Metropolitan system broke up the property was foreclosed and the plant shut down, hence this investment was lost. Mr. Chalmers testified that he was now purchasing power from the Interborough Rapid Transit Company through the New York Railways and is now paying 2.6045 cents per kilowatt-hour for it. The Interborough charged the New York Railways 1.7012 cents per kilowatt-hour for direct current, claiming there was a 10 per cent profit only in that charge. The witness estimated that the profit of the New York Railways in the sale of power was 53.1 per cent at this price. A memorandum dated Jan. 14, 1920, giving the basis of charges for power at that time was submitted in evidence as follows:

Basis of charges per kilowatt-hour to Second Avenue:

	Cents	Cents
To cost per kilowatt-hour from I. R. T. to New York Rys.		1.1197
To Transmission Charges		
To losses	0.0205	.....
Operation and maintenance	0.0197	.....
Fixed charges	0.2130	0.2532
To Conversion Charges		
Losses	0.1110	.....
Operation and maintenance	0.1110	.....
Fixed charges	0.3290	0.5510
		1.9239
To profit at 18.7 per cent		0.3601
		2.284

Statistics of the New York & Queens County Railway, New York & Long Island Traction Company and Long Island Electric Railway were then presented, showing poor physical condition of the car equipment. It was stated that some of the cars on the New York & Queens County Railway had operated over 150,000 miles without overhauling and only eleven cars had been overhauled since January, 1921.

DR. WILCOX PRESENTS HIS VIEWS

At the proceedings on Wednesday, Dec. 21, at which volunteers were to be heard, the principal witness was Dr. Delos F. Wilcox, who criticised various provisions in the plan of the commission and argued in favor of municipal ownership. He claimed that service at cost as tried in Cleveland, Montreal, Boston and Cincinnati had been unsatisfactory, and he thought that "the power of the 'traction trust,' so called, in past years has been in some ways moderate in comparison with the power that will be exercised by the gigantic operating monopoly which the commission sets up as the goal of its endeavors."

Other witnesses who testified on Dec. 21 were President George B. Cromwell of the Borough of Richmond; Frederick Van Z. Lane and Robert W. Higbie.

Railway Will Be Exempt from 1922 Tax

To relieve the public from the necessity of paying a higher rate of fare for the first six months of 1922, the city of Cincinnati (Ohio) has approved a plan of William Jerome Kuertz, Director of Street Railways, whereby the Cincinnati Traction Company will not pay its annual tax to the city of $350,000 for 1922. With the recommendation of Mr. Kuertz and the indorsement of the city's executives, it is said the adoption of the plan by the City Council is assured.

While the plan takes away from the city $350,000 at a time when the city government is in serious financial condition, without a definite plan to raise the $800,000 needed to complete its appropriations in full, it is justified by Mr. Kuertz and the city administration on the following grounds:

1. That under the provisions of the "service at cost" franchise, an annual tax of $350,000 is made payable to the city only when the revenues of the traction company are sufficient to pay the operating expenses and such other items as are made a prior charge upon the gross receipts.
2. That other large cities of Ohio do not charge their street railway companies such a tax, and
3. That if the tax was charged for 1922 it would necessitate an increase in fare, which Mayor John Galvin and Mr. Kuertz believe would be incompatible with the present tendency toward lower prices everywhere manifested.

In regard to the street railway situation here, Mr. Kuertz said that there were but two courses open to the city:

1. It may pass an ordinance similar to the one passed last June with reference to the city's tax for the year 1920 and 1921, providing that the failure of the present rate of far to produce revenue sufficient to pay the city's tax for the year 1922 shall not operate to increase the rate of fare now in effect, or
2. Allow the provisions of the revision ordinance to operate, which will automatically cause fares to be increased.

The advantages and disadvantages of the two courses were explained by Mr. Kuertz in a report to Mayor Galvin.

City Names Expert to Examine Transit Plan

Corporation Counsel John P. O'Brien of New York City has appointed William A. DeFord a special assistant to analyze for the city the plan of the Transit Commission for the consolidation of all the traction lines and their transfer to municipal control. Mr. O'Brien stated that the appointment in no way affected "the soundness of the contention by the city" that the act creating the commission and vesting it with its powers was unconstitutional, Mr. O'Brien said:

I have retained William A. DeFord as my special assistant to make a comprehensive survey of the plan of readjustment which you may finally adopt, to analyze carefully the contracts and other means which it proposes to employ for the execution of that plan, and to accumulate such information as I deem essential to enable the city authorities to consider it intelligently.

The Transit Commission will greatly facilitate the making of the proposed survey, and will expedite the formulation of the views of the city authorities with respect to the plan, if it will grant Mr. DeFord access to all information and data in its possession, inclusive of the reports of its engineers, appraisers and accountants, which he may deem of value to his inquiry.

I deem it my duty (while having the fullest confidence in the soundness of the contention that the act is unconstitutional) to take such steps as will enable the city authorities, in any eventuality whatsoever, to safeguard the city's interests.

Proposed Electric Line in Upper New York Under Consideration

Plans are under way for the construction of an electric railway from Buffalo to Wellsville, N. Y., over the abandoned roadbed of the Buffalo & Wellsville line owned by C. A. Finnegan, Buffalo. Representatives of the cities and villages along the line have held several conferences with Mr. Finnegan and a group of Buffalo bankers over ways and means of financing the proposed electric freight and passenger line. It is proposed to finance the road with a bond issue of about $1,000,000.

The proposed line would cost close to $1,100,000, according to estimates given by electric railway interests. The estimates for various equipment are: rails, $250,000; ties, $125,000; laying track, $80,000; bridges, $150,000; ten booster stations, $60,000; poles and wires, $200,000; equipment, $125,000, and incidentals, $60,000.

It has been suggested that arrangements could be made to enter Buffalo over the tracks of the Buffalo & Lake Erie Traction Company, connecting near Hamburg. Among the larger communities along the proposed line are Wellsville, Belmont, Centerville, Arcade and Springville. The Buffalo & Wellsville line was abandoned during the war and Mr. Finnegan sold all the equipment to the French government.

The new company will probably be known as the Buffalo, Arcade & Wellsville Electric Traction Company. The promoters are represented by J. S. Joyce, 75 West Huron Street, Buffalo, N. Y.

Galesburg Company Asks for Franchise

The Galesburg Railway, Lighting & Power Company has asked for a new franchise in Galesburg, Ill., and accompanied the ordinance which it presented to the Council with frontage petitions signed by a majority of property owners on all streets except West Main Street.

The difficulty in securing a majority of West Main Street signers was said to be that many people objected to any railway on the street, and also that the owners objected to the paving clause. In answering the attack on the paving clause, R. F. Carley, manager of the traction company, called attention to the recent decision of the Public Utilities Commission in the Chicago street railway case, in which the principle was laid down that the city of Chicago must hereafter pay for paving to be done between the rails. He stated that the Galesburg company was asking nothing that would not soon be general practice in this respect.

Cable Car Runs Wild

Fillmore Street in San Francisco, Cal., has a combination cable and electric line, one of the very few in the country. The line is a very short one and for a distance of two blocks the grades are as high as 24 per cent and 25.4 per cent, respectively. Two cars are operated on the line, connected by an underground cable, so that one balances the other. The excess power required for operation is furnished by electric motors on the cars so that the system is a combined cable and electric system.

On Nov. 16 the cable on this line broke when one of the cars was near the top of the hill and it sped furiously down, finally leaving the track and splintering an overhead pole. Six persons were injured.

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POLE HALTS RUNAWAY CAR

Estimate Moving Platform Cost

The proposed river to river moving platform, intended to care for cross-town traffic in New York city, would carry approximately 32,000 persons an hour, which would equal the capacity of seventy-two ten-car subway trains. Daniel L. Turner, chief consulting engineer of the Transit Commission, presented these statistics to municipal engineers recently. Estimates place the cost of construction at $7,500,000 and cost of equipment for operation at $3,000,000. The operating cost on the basis of 15,000,000 passengers a year would be $500,000, with an additional $25,000 for each extra million.

New York Denied Municipal Trolley Line

The right to operate a municipal trolley line as a shuttle over the Williamsburg Bridge without first obtaining a certificate of convenience was denied New York City in a decision of the Appellate Division of the Supreme Court, Second Department, which reverses the order of the lower court of last July. That order allowed the city to operate local service over the bridge in competition with the lines of the Brooklyn Rapid Transit Company.

The matter of municipal operation of a trolley line across the bridge has been hanging fire for several months. Grover Whalen, Commissioner of Plant and Structures for the city, early in the spring announced that service would be started on March 1. He assembled materials for a carhouse to be built in Brooklyn and for the tracks connecting it with the bridge tracks. These would cross the tracks of the Brooklyn Rapid Transit, and that company immediately got out an injunction against the city, making the points that the proposed crossing would become a source of danger; that the city had no constitutional right to run cars over the bridge, and that the city had no certificate of convenience.

At the same time the injunction was sought the city asked that a board of three commissioners be appointed to condemn the transit company's right-of-way and chose the point of crossing for the tracks. Both motions were granted, but the commission appointment was delayed for so long that operation of the municipal line had to be postponed beyond April 1.

The Brooklyn Rapid Transit Company, which had announced that it would discontinue its through service over the bridge on that date, continued its lines when the municipal service was delayed. The threatened abolition of the Rapid Transit Company's service would have thrown a great burden upon the local bridge line, but Commissioner Whalen promised that the city would meet the situation.

It was estimated that the municipal shuttle service over the bridge would have been given to the public for 1 cent a ride.

Through Electric Interurban Proposed

Negotiations are under way for financing the construction of a bridge across the International River connecting Buffalo, N. Y., with Bridgeburg, Ont. Private interests in the United States and Canada are organizing a syndicate to apply to the federal government in Washington and the Dominion authorities at Ottawa for permission to bridge the river at this point.

It is proposed to have the Canadian hydro-radials in the Niagara frontier district enter Buffalo via the proposed structure. This would give a through electric interurban line connecting Buffalo with Toronto, Ont., by way of Welland, St. Catharines and Hamilton. This line also would connect with the proposed Canadian lake shore line to Port Colborne, which has been under consideration for several years. Towns along the proposed raight-of-way already have given authority to construct the line, which would serve the north shore summer colony.

Improvement Program Being Arranged

Work has been started on the schedule of improvements laid out recently for the Dallas (Tex.) Railway. This is in accordance with the agreement between officials of the Dallas Railway and the Supervisor of Public Utilities, John W. Everman, that as soon as the company elected a president to succeed the late Col. J. F. Strickland both the city and the officials of the company would prepare a program of improvements and betterments covering the next few years.

Although the complete programs have not been announced, Mr. Everman says he will provide for the building of the Lindsley Avenue extension to Mount Auburn, as well as some additions to the Terrell interurban line over which cars will be run to Parkview.

Much pressure is being brought to bear on Mr. Everman to include the proposed viaduct over the Trinity River bottoms. Mr. Everman has explained that such viaduct, if built, would have to be built by the Northern Texas Traction Company, which owns the Oak Cliff lines and the Dallas-Fort Worth Interurban line. Under the terms of the franchise and the lease agreement between the Dallas Railway and the Northern Texas Traction Company, the Dallas Railway would have to take over the viaduct when built and pay the Northern Texas Traction Company 7 per cent interest annually on the investment. Mr. Everman says it would cost $500,000 to build the viaduct, and that this would mean an interest charge of $35,000 annually on the Dallas Railway or about $100 a day. Such an interest charge would make a 7-cent fare necessary, Mr. Everman says, and he is not in favor of such an increase in fares.

The Dallas Railway now has approximately $100,000 in reserve to be spent for street improvements, this amount having been realized over and above the authorized earnings of 7 per cent during the last few months, during which earnings have been around 8 per cent.

It is expected to be a month or more before the schedule of improvements is completed and finally agreed on.

Agreement Reached in Fresno

Franchise conferences at Fresno, Cal., have resulted in an agreement between officials of the Fresno Traction Company and the City Council as to the terms to be granted to the company. Under the proposed plan a fifty year franchise will be allowed the company. The city will be given an option on the purchase of the road at ten year intervals, paying the railway the value of the property at the time the exercise of the option may be desired. The proposed agreement provides that the company will pave the street between the rails and a foot on each side of the rails.

The Fresno Traction Company is controlled by the Southern Pacific Company. Paul Shoup, vice-president of the property, in commenting on the conference, made the following statements:

> The Fresno Traction company has not been a paying investment due to development of the automobile, but, with the growth of the city and a lesser inclination because of downtown congestion, to use machines when a street car is available, I believe it should be possible to demonstrate that the public can be usefully served by street car transportation without loss to owners.
>
> The city can help by relieving transportation from unnecessary burdens, making possible certain and prompt adjustment of fares up and down to meet actual needs under supervision of the State Railroad Commission and granting such franchise tenure as will assure safety of investment aside from the question of fares.

New Company Incorporated in Franchise Case

Initial steps in making two systems of the Aurora, Elgin & Chicago Railroad were taken at Springfield, Ill., on Dec. 13 when the Aurora, Elgin & Fox River Electric Company, Aurora, was incorporated to furnish electric light and power. The capital stock of the new company is $20,000. It is held by Joseph K. Choate, New York, receiver, to the amount of $4,950; Benjamin F. Alschuler, Aurora, $25, and Edwin C. Faber, general manager for the receiver, $25.

The organization of the new company was necessary to carry out provisions of an order, issued by Judge Evan A. Evans, instructing the receiver of the Aurora, Elgin & Chicago Railroad, to incorporate a new company and take all the stock in his own name and the name of his nominees for the purpose of providing a company to take out new franchises in the Fox River valley. It is explained that under the law a franchise for operating a public utility can be issued only to a corporation, and not to a receiver. In other words, the new organization came into existence under the general incorporation act, to apply for franchises in its own name and not in the name of the Aurora, Elgin & Chicago railroad, avoiding possibility of legal entanglements.

Louisville Employee to Be Director

A director for the Louisville (Ky.) Railway is to be chosen from among the ranks of the workers. Announcement to this effect was made at a meeting of the motormen and conductors tendered them recently by J. P. Barnes, president of the company. The dinner was given the men of two carhouses which were winners in a contest for those carhouses having the smallest number of accidents per milage.

Every man in the company's employ, to the number of approximately 1,500, is to have a voice in the election of the new director who will sit for the first time at the annual meeting of the board on Feb. 15. He will be elected at a date in January to be set by the Co-operative Welfare Association. The entire force of the Louisville Railway employees for two years past has been organized in a Co-operative Welfare Association which meets monthly to consider matters of interest to employees.

No date for the election can be set until the Co-operative Welfare Association meets and formally receives and accepts the company's announcement. The January meeting of the association will be Jan. 9, but the election may be held at the next monthly meeting, Feb. 12, in ample time for the successful man to take his seat at the annual election of the board of directors three days later.

News Notes

Will Vote on Franchise.—A new franchise for the Menominee & Marinette Light & Traction Company, Menominee, Mich., will be submitted to a vote of the people at a special election probably in January. This decision was recently made by the City Council at a meeting called to discuss terms for the new franchise.

Picking Up Passengers Scored.—In the symposium entitled "Truth," published daily by the Memphis (Tenn.) Street Railway to educate the Memphis public, the receivers, T. H. Tutwiler and F. Elgin, say a word to the automobile owners about picking up chance passengers and taking that much revenue away from the company.

Health Rules to Be Published.—Because of numerous inquiries and complaints about the ventilation of cars of the Cincinnati (Ohio) Traction Company, William Jerome Kuertz, Street Railway Director has announced that after the Christmas rush the railway will post in every car a copy of the Board of Health Regulations governing the ventilation of cars.

Will Study Situation.—A committee composed of Council representatives of Wheeling, W. Va., and Ohio towns will hold a conference on the passenger transportation situation in the Wheeling district. The matter has become acute recently over the efforts of the Ultimate Bus Company to secure a permit from the city of Wheeling. The Wheeling Traction Company has opposed the grant. It is believed that a plan is being worked out which will be acceptable to railway and buses.

Pacific Electric Out of Terminal Project.—The Pacific Electric Railway, Los Angeles, Cal., is not required to join the steam roads, including the Southern Pacific, the Salt Lake and the Santa Fé, in building a union terminal at the Plaza site. The order for the construction of the union passenger station is contained in a decision on rehearing of the so-called Los Angeles terminal cases and is a reaffirmation of the commission's former decision. The commission held that there was not sufficient justification for including the Pacific Electric interurban lines in the project. The company will be required to solve certain grade crossing problems.

To Dismiss Employees, Railway's Right—An arbitration commission recently handed down a decision upholding the right of a railway to dismiss an employee. The Eastern Pennsylvania Railways, Pottsville, Pa., dismissed a motorman, John Dormer, after a wreck in which seventeen persons were injured. The Amalgamated Association took up the complaint of the motorman in question and claimed that he should be re-employed. The railway claimed that it had the right to dismiss an employee, but agreed to submit the matter to an arbitration commission. The commission's opinion against Dormer was unanimous and his complaint was thrown out.

Financial and Corporate

Financial Readjustment Proposed

A special meeting of shareholders of the Federal Light & Traction Company, New York, N. Y., has been called for Jan. 11 to consider changing capitalization and readjustment of finances. It is proposed:

To increase the capital stock by $10,000,000 to $21,000,000, new stock being in form of cumulative first preferred 8 per cent stock, having priority over present preferred and redeemable at any time at $110 a share.

To amend certificate of incorporation to permit issuance of 55,000 shares no par common stock to be exchanged share for share for present common.

To modify terms of company's thirty year first lien 5 per cent bonds to permit from 5 per cent to not exceeding 7½ per cent interest rate on all or any part of such bonds heretofore or hereafter issued; provide that such additional interest shall be entitled to the benefit and security of any future mortgage; that all or any part of such bonds be made callable at price above present call price as may be fixed by directors; that company, at its option, can spend for betterments of properties, moneys accruing to sinking fund under said mortgage.

To authorize issuance of preferred stocks by subsidiaries without subjecting such stocks to lien to said mortgage.

To authorize refunding Springfield Railway & Light 5 per cent bonds and Central Arkansas Railway & Light 5 per cent bonds by issuance of Federal Light & Traction Company 30-year 5 per cent bonds (but bearing interest at not exceeding 7½ per cent of such increased interest on such bonds be authorized as recommended), and to authorize directors at their discretion to do such action as may be necessary.

To authorize execution of a general and refunding mortgage to secure bonds, notes or debentures which may be issued from time to time in series bearing interest not exceeding 8 per cent.

$9,685,000 Railway Bonds Mature in January

Public utility bonds maturing in January, 1922, amount to $14,708,300. The principal railway properties included are the following:

Company	Rate	Amount
Columbus Railway Power & Light Company, notes	8	$2,500,000
Little Rock Railway & Electric Company, 1-year	8	700,000
Springfield & Eastern Railway 1st	5	330,000
Cent. Market Street Railway 1st	5	325,000
Eastern Massachusetts Street Railway, ref.	6	300,000
New Bedford & Onset Railway 1st	5	280,000
Virginia Railway & Power Company, notes	6	250,000
Minn. Street Railway, joint cons.	7	5,000,000
	Total	$9,685,000

Seeks Abandonment—Blames Ford

The Interurban Railway & Terminal Company, Cincinnati, Ohio, has petitioned the State Public Utilities Commission for permission to abandon its two lines. One line runs from Cincinnati to Lebanon and the other from Cincinnati to New Richmond.

According to F. Dinsmore, counsel for the company, who ascribes the failure of the road to the Ford, it would be cheaper to sell the road as junk than to continue service.

The deficit in 1918 was $18,000; 1919, $13,000; 1920, $20,000; 1921, so far $18,000.

The receiver of the road is Charles M. Leslie.

Toledo Outlook Improved

Company Hopes Soon to Put on Fifty One-Man Cars to Combat Autos

The increased patronage of the Community Traction Company, at Toledo, Ohio, and the improvement of the physical condition of the property, together with economies in management effected since the operation of the service-at-cost ordinance, will probably enable the company to purchase fifty new one-man cars in the near future. At least, Wilfred E. Cann, street railway commissioner has made some tentative plans in that direction. He believes that the new equipment may be a step toward better business and also help to meet motor bus competition.

The report of the railway for November, made to the board of control at its meeting during the week ended Dec. 17 indicates that the property is continuing to turn a surplus into the stabilizing fund.

As for December, the commissioner's daily reports the first half of the month show an increase of $7,036 in fare receipts as compared with the same period last month.

After payment of all operating expenses, interest charges and taxes in November, $17,708 was placed in the sinking fund, which goes toward the purchase of the lines by the city, and there was a balance of $8,200 applicable to the fare stabilizing fund, bringing it up to $63,544. It was expected that the surplus for November would be about $25,000, but the company was forced to set aside $15,762 for half of the state excise tax of 1½ per cent on gross earnings of public utilities. The allotment for maintenance has also been increased and cars are being overhauled at the shops at a rate of ten a month instead of three as heretofore.

The total amount now in the sinking fund, set aside for ultimate ownership of the traction property by the city, is $177,083. Part of this sum is invested in bonds of the railway which are participating in the earnings of the property.

The operating expense has been decreased from 42.86 cents per car-mile in February, the first month under the present plan, to 36.50 cents per car-mile last month. The average income per car-mile in February was 44.5 cents. In July it fell to 38.1 cents, but for November was 45.26 cents. The ratio of operating expense to income last February was 92.21 per cent. It is now 72.82 per cent.

There was a small decrease in November in the number of passengers carried as compared with October and a corresponding decrease in car-mileage due to the difference of one day between October and November, but the daily car-mileage and the number of passengers carried were a little larger than the previous month. The total of revenue passengers in November was 4,699,809.

Cleveland Stock Not to Be Sold at Discount

The directors of the Cleveland, Ohio, Railway on Dec. 22, refused to accept a resolution adopted by the City Council authorizing the company to sell $160,000 par value of its stock at $87 a share, for the purpose of building a new extension along Broadview Road in South Brooklyn.

The franchise under which the company operates in Cleveland calls for the sale of the company's stock at $87 because the company's dividends are held to 6 per cent annually and voters of the city a year ago refused to sanction an increase to 7 per cent.

John J. Stanley, president of the company, said:

The main reason why the Council's resolution is not acceptable to the company is because it is a makeshift financing scheme. The intentions of the company's franchise is plain that stock must be sold at not less than par and the city faces the problem of putting our stock above par and keeping it there not for one extension alone, but for all the extensions and additions which the continued growth of Cleveland demands. Half-way measures and makeshift expedients are unsound economically, but are especially unwise financially for this system.

Successor Company Organizes

The Olean, Bradford & Salamanca Railway, Olean, N. Y., the successor company under foreclosure to the Western New York & Pennsylvania Traction Company, has organized with officers as follows:

President, C. N. Mason; vice-president, J. P. Quigley; secretary and treasurer, L. W. Osborne; auditor, D. S. Nicholas; general manager, R. H. Wheeler; general superintendent, I. W. Miller; chief engineer, W. K. Page; traffic manager, W. P. Bailey; master mechanic, W. I. Berryman.

$28,935,655 Lost by New Haven Railroad on Its Rhode Island Trolleys

Losses sustained by the "New Haven" road through the forced sale of the electric railways in Rhode Island caused the steam railroad to have a deficit of $31,824 in 1920, the loss from the sale of the electric railways alone aggregating $28,935,655, according to the annual report which the Connecticut Public Utilities Commission submitted to Governor Lake at Hartford, Conn., on Dec. 17. During the past year this loss has been charged off to profit and loss, the commission points out. The 1920 deficit of more than $31,000,000 is contrasted with the surplus of $2,078,352 which the "New Haven" road had in 1919.

A feature of the report is an increase of $2,411,363 in the Connecticut Company's investment in road and equipment, which at the close of 1920 was $55,457,931. The total investment, including some other sources, was $55,529,430. The capital stock remains the same, at $40,000,000.

According to the report on Nov. 30, 1921, the Connecticut Company had a total deficit of $1,436,091. The total operating revenue was $13,089,317, showing an increase of $2,045,512. Of the increase $1,913,979 was from passenger transportation.

The total deficit of the Hartford & Springfield Street Railway Company, since it went into receivership in 1919 is $118,958 according to the report.

Cleveland's Accumulated Deficit Now Only $145,610

Business conditions in Cleveland, Ohio. continue to improve, slightly it is true, but nevertheless steadily. This is shown in the November report of the Cleveland Railway, received by the directors at their meeting on Dec. 22.

The November report showed that the deficit in the interest fund, the fare barometer, had been reduced by $26,596 during the month. This cuts the accumulated deficit to $145,610 in this fund. The surplus balance in the company's operating fund is so great that if business conditions continue to improve there is little doubt but that there may be a reduction in fare by the middle of next summer, as predicted by Fielder Sanders, the city street railway commissioner.

The number of car riders carried by the Cleveland Railway in November totaled 31,992,555, a decrease of 11.72 per cent over last year. This is a marked improvement, as recently the decrease in the number of riders, month by month, had been running as high as 17 per cent.

The directors adopted a memorial extolling the late Henry J. Davies, who up to his death on Dec. 3 last had been secretary and treasurer of the company for many years.

Cape Fear Railways Is Successor

The North State Power Company, Raileigh, S. C., which on Aug. 16, 1921, bought the Cumberland Railway & Power Company when the receivership of that company was terminated, sold its railway holdings on Dec. 7 to the Cape Fear Railways, Inc. This company is a new corporation, with its home office in Fayetteville, but with its general offices in Raleigh. The capital stock is $50,000 an the extension of the present system to a total length of 20 miles is immediately contemplated. Previous sale of the Cumberland Railway & Power Company to a company of bondholders was recorded in the ELECTRIC RAILWAY JOURNAL for July 30, 1921.

Receiver for Houghton Company

A federal receiver was appointed Nov. 29 for the Houghton County Traction Company, Houghton, Mich. Samuel B. Tuell is now in charge of the company's interests.

Young Men's Club Operates Cars

The company organized some time ago at Brunswick, Ga., by the Young Men's Club of that city to operate the electric railway system there took formal possession of the properties on Dec. 1 and is now running the cars. The Brunswick property, known as the City & Surburban Railway, failed some time ago and abandonment of the system followed.

The new company is known as the Brunswick & Interurban Railway. The present fare is 7 cents, but it is believed that as soon as the necessary legal arrangements can be made the fare will be reduced to 5 cents. Previous references have been made in the ELECTRIC RAILWAY JOURNAL to the activities of the Young Men's Club in trying to keep railway service in this city.

Financial News Notes

Railway Pays Back Taxes.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., is now paying the city of Trenton back taxes for the past four years, the sum of $150,000 having been paid into the city treasury thus far. The company was unable to pay the back taxes until an 8-cent fare was granted.

Receiver Authorized to Settle Claims.—Federal Judge John M. Killits at Toledo, Ohio, has authorized B. J. Jones, receiver for the Ohio Electric Railway, to defend at his discretion all suits against the bankrupt railway brought before his appointment as receiver. He authorized the receiver to settle claims also in case they are for small amounts. All claims must be brought before the court for approval.

Part of Dividend Arrears Paid.—The board of directors of the West Penn Traction & Water Power Company, Pittsburgh, Pa., has declared its regular quarterly dividend of 1¼ per cent on its 6 per cent cumulative preferred stock, payable on Feb. 15 to stockholders of record of Jan. 16, 1922, and also a dividend of 1¼ per cent on account of dividends in arrears accumulated upon its preferred stocks prior to 1917.

Mexican Property Transferred.—The Chihuahua Electric & Railway Company, Chihuahua, Mexico, has been taken over by R. Lopez Negrete, Durango, and his associates. The holdings include the local electric light and power plant and street railway system. The new owners plan to install new machinery and equipment and to rehabilitate and extend the electric railway lines. During the revolutionary period in Mexico the property underwent heavy losses.

Railway Patrons Seek Tax Reduction.—Citizens along the Defiance branch of the Indiana, Columbus & Eastern Traction Company, which the company has petitioned to abandon, will soon file a petition with the State Tax Commission of Ohio asking for a reduction in the valuation from approximately $800,000 to about one-third that amount. It is claimed that such a reduction will mean a saving in taxes to the Indiana, Columbus & Eastern Traction Company of $10,000 and will so reduce expenses that operation of the branch may continue.

Court Authorizes Payment of Back Interest.—The bondholders' protective committee of securities and corporations included in the Pittsburgh (Pa.) Railways system announces that the United States District Court for the western district of Pennsylvania has signed an order authorizing the receivers of the Pittsburgh Railways to pay one year's back interest on the United Traction Company general mortgage 5 per cent bonds. The two instalments to be paid are July 1, 1919, and Jan. 1, 1920.

Memphis Reports Profit.—The Memphis (Tenn.) Street Railway in November made a profit of $5,276 over and above the 6½ per cent allowed by the Public Utilities Commission. A report of November operations shows a total of 3,709,558 revenue passengers was carried as compared to 4,147,553 in November of last year. Gross income was $261,514 against $287,844 for November, 1920. Cost of service in November, 1921, was only $256,238 while in 1920 the cost was $314,507. During the month of November, 1920, the report shows there was a deficit of $26,663.

Hudson & Manhattan Issue Authorized.—The application for the issue of $1,046,000 of first lien and refunding mortgage bonds by the Hudson & Manhattan Railroad, New York, N. Y., on or before June 30, 1922, has been approved by the Public Utility Commission. The previous utility commission issued on June 3, 1919, a certificate of approval for this issue at face value of the bonds payable on Feb. 1, 1957, bearing interest at 5 per cent. The object of the issue according to the report, is to reimburse the company for expenditures made for the construction, completion, extension or improvement of its facilities or for the discharge of its obligations.

Hearing on Receivership Application Postponed.—Judge Julius M. Mayer in the United States District Court on Dec. 21 heard the postponed application by Clarence Venner for the appointment of a receiver for the Interborough Rapid Transit Company, New York, N. Y. Judge Mayer set Jan. 30 as the time when arguments on the application will be heard. He also set Jan. 20 as the date when all answers to bills must be filed and Jan. 26 when reply affidavits should be served on J. L. Quackenbush, attorney for the Interborough. Mr. Quackenbush reported to the court the following conditions on Interborough notes: $36,155,900 deposited for extensions, $38,144,400 total, showing that 94.79 per cent have been deposited, leaving $1,988,500 outstanding. He also stated that since the hearing before the court on Oct. 27, $712,900 of notes have been deposited and that $7,144,000 have been deposited since the application for the appointment of a receiver was first made by Mr. Venner.

$5,000,000 Columbus Issue Offered.—Harris, Forbes & Company, New York, N. Y., and Elston, Allyn & Company, Chicago, Ill., offered for subscription on Dec. 22 $5,000,00 of refunding mortgage gold bonds, 6 per cent series, due 1941, of the Columbus Railway, Power & Light Company, Columbus, Ohio. The subscription price was 93½ and interest, yielding about 6.60 per cent. The proceeds, it was announced, would be used to take up floating debts and to provide other funds. The bankers explained that the gross earnings of the company for the year ended Nov. 30, 1921, were more than $6,900,000, and the net earnings more than three times the annual interest charges on funded debt with the public, including this issue. More than 59 per cent of the net earnings were derived from the electric light and power business, and such net earnings alone amounted to more than three times the annual interest charges on all first refunding and extension bonds outstanding with the public and this issue of refunding mortgage bonds.

Traffic and Transportation

Improvements in Prospect

Detroit Mayor Suggests a Combination Bus-Railway Service for Rapid Transit and to Relieve Congestion

With the joint use of certain of the street car lines arranged between the city of Detroit, Mich., and the Detroit United Railway, and the universal transfer effective between the company's lines and the M. O. lines, Mayor James Couzens announced some views as to methods which he believes will further improve Detroit's street car service. Among the further steps advocated by the Mayor are the establishing of city bus lines and the turning of interurban cars and interurban buses at local terminals to be established at the city limits.

The new idea is to combine buses and street car service all under municipal control. Electric railway lines are to be maintained on the main thoroughfares as at present. In between the main lines would be bus lines taking parallel streets, or zig-zagging along the same general direction. The latter, it is cited, would serve more people by covering more territory. The long distance traffic would be handled by street cars and the short by buses, making fewer stops necessary for the cars within a two-mile radius from the city hall. This, it is believed, would result in more rapid service and relieve congestion.

If the city acquires a bus system, it is planned to issue transfers from the cars to the buses. The buses may also be used during the rush hours to augment street car service on the main arteries of traffic, branching out to the parallel streets during other periods of the day.

It is the Mayor's belief that the bus lines could be operated more economically by the city than by the private companies, with both cars and buses operated by the M. O. general operating staff. He further believes that it will be possible under the governing conditions to reduce the bus fare from 10 cents to 7 or 8 cents.

Nothing Succeeds Like Safety Contests

A plan started the early part of this year for the purpose of reducing accidents on the railway systems operated by the Southern Public Utilities Company, in Greenville, S. C., and Charlotte and Winston-Salem, N. C., has actually worked out very satisfactorily in reducing accidents.

Early in 1921 the company announced that prizes totaling $500 would be awarded to members of various teams among the electric railway employees of the cities above named, the awards to go to the teams with the best records. The initial contest was to run over a period of three months. Results of this contest proved so satisfactory that two other contests were then arranged, and results of the latter two are all the more remarkable considering the fact that no prizes were offered in these contests.

Results are noted by the reduction in accidents in the three cities during the third contest, completed only recently, as compared with the first contest held early in the year. At Charlotte there were ninety-six accidents during the first contest and fifty during the third. Thirty men came through with a perfect score during the first contest, and fifty-one during the third. At Winston-Salem there were 125 accidents during the first contest and fifty-one during the third; nineteen men came through with a perfect score in the first contest, and thirty-four in the third. At Greenville there were 184 accidents during the first contest and only nineteen during the third; only four men came through with a perfect score in the first contest, while twenty-six had a perfect score during the third.

All men having a perfect score in the third contest were presented with raincoats by President E. C. Marshall, who announced that results were so successful that similar safety contests will be held during 1922.

St. Paul Fare Rise Set Aside

Judge F. M. Catlin of Ramsey District Court in Minnesota on Dec. 27, set aside the order of Aug. 30 by the State Railroad & Warehouse Commission granting the St. Paul City Railway an increase in fare to more than 6 cents.

After the St. Paul City Railway had been granted an emergency rate of 7 cents by the Minnesota Railroad & Warehouse Commission, Judge J. C. Michael issued an order last September restraining the company from collecting the increased fare. The railway appealed from this order, and arguments were made on Nov. 27. This decision temporarily blocks a renewal of appeal to the Federal Court for an injunction to prevent the city from stopping collection of the higher rate. Another hearing will be held on Jan. 14. The judge held that the commission had no facts on which to base the order.

The city contended that the commission had made no effort to learn whether the costs and expenses mentioned in the application by the company were reasonable. The rate of fare has been 6 cents. Details of the case were given in the ELECTRIC RAILWAY JOURNAL for Nov. 12, page 883.

Interurban Belt Railway Urged

The construction of an interurban belt railway around Indianapolis, Ind., is being urged by prominent financiers in the vicinity. It is believed that such a line would mean a bigger future for the city for it would provide a better distribution of the freight business handled by the railway and would save millions of dollars to the interurbans and ultimately to the people of Indianapolis. Especially interested in this proposal is G. J. Marott, who claims the financing of the project would be simple if the city backed the bonds. In outlining the plan Mr. Marott said in part:

> My plan would be first to construct an interurban belt that would connect with all traction lines entering the city. All interburban freight would be distributed over this railroad, say to four stations situated at points on the belt of easy accessibility. This belt would be operated by the present street car company, under direct supervision of the city government.
>
> It would be my plan to establish a freight station at a certain point where country produce, such as potatoes, cabbage, poultry, eggs and perishables could be received and sold direct to our retailers and grocers. This station would be in charge of some one appointed by the city who would have authority to represent the consignor and sell at the best market price. Or the consignor himself could accompany his shipment and sell his own goods.

Low Fare Measure Lost

Seattle Councilmen Desert Mr. Fitzgerald in His Plea for a Five-Cent Fare

By a vote of six to two, the City Council of Seattle, Wash., has rejected the proposed ordinance prescribing a 5-cent fare for the Municipal Railway. The ordinance was proposed by C. B. Fitzgerald, chairman of the finance committee of the Council. The vote of the Council revealed the fact that the only supporter of the measure was Councilman Fitzgerald himself. Councilman Moore voted with Mr. Fitzgerald against indefinitely postponing the measure, but announced he would not cast a ballot for the ordinance, but would favor referring it to the voters at the spring election.

Mr. Fitzgerald, in explaining his ordinance, stated that the only change it provided from the existing fare rate was a reduction from 8½ to 5 cents, with an addition of a transfer charge of 2 cents. Under the proposed measure, however, only trainmen in uniform would be carried free instead of all employees of the utilities department.

Mr. Fitzgerald said:

> I should like to see the fare effective now and I think it was a mistake ever to increase the fare. I know there is considerable difference of opinion on the matter in the city. I believe the 8½-cent is more than the traffic will stand.

The reduction in fare would result in a deficit estimated by Peter Witt at $1,500,000. Mr. Witt also stated that with an expenditure of approximately $2,000,000 for new cars, tracks and improvements to the municipal railway system, a permanent saving of $1,700,000 could be effected.

D. W. Henderson superintendent of the Municipal Railway, agreed that such improvements are necessary to the system, but in connection with a reduction in fare, pointed out that if the money was available for purchase of such new cars, it would take at least a year to obtain these cars and put them in operation. Mr. Henderson favors the use of lighter cars than the ones now in use, and does not favor converting the present heavy cars into one-man cars.

Before the 5-cent fare ordinance was acted upon, leading lawyers throughout the city were consulted in regard to the legal aspects of such a move. Representatives of the firms questioned concurred in the opinion of Corporation Counsel Walter F. Meier that an inadequate fare on the railway would make the city liable to damages which would place the general fund of the city behind the $15,000,000 of bonds given to Stone & Webster for the car system. This would bring the securities up to par value, and result in a loss estimated at $7,500,000 to the people of Seattle. Counsel Meier's opinion is also concurred in by Mayor Hugh M. Caldwell. who has strongly opposed the reduction in fare, with concurrent danger of invading the general fund.

Disapproves of Overlap System

The Department of Public Utilities has dismissed the petition of the Board of Aldermen of Chicopee, Mass., for a rearrangement of the fare zones on the lines of the Holyoke Street Railway. The petitioners sought overlaps between the towns of Chicopee Falls and Chicopee Center.

It was also suggested that the fare limit on the Fairview line from Hartford Street, at the town line between South Hadley Falls and Chicopee, be moved to Montcalm Street in Chicopee, permitting a ride from Holyoke city hall of about one mile farther than at present afforded.

In dismissing the petition the department said in part:

> We have made a careful study of the situation in Chicopee as related to the entire area served by the street railway, and we think it inadvisable to establish a system of overlaps. The establishment of such overlaps necessarily would call for like treatment in other parts of the system and would postpone the time when the street railway company would be able to reduce its fares applicable to its fare limits from 6 to 5 cents. As to the situation on the Fairview line, while it is true that the fare limit from the city hall to the line between South Hadley Falls and Chicopee is somewhat short, nevertheless it is no shorter than in two other instances within the city of Holyoke.

Ten-Cent Rate Authorized

The Montana Public Service Commission has authorized the Missoula Street Railway to put a 10-cent cash fare into effect on Jan. 1. The decision also provides for the sale of tickets at 6¼ cents.

The present rate is 8 cents cash and a 7-cent ticket charge. This schedule the company claimed was inadequate. The new 10-cent fare is the same in effect in Helena and Butte.

Public Service Asks Rehearing in Jitney Case

The Public Service Railway, Newark, N. J., has asked the Court of Errors and Appeals to rehear the jitney case in which the Chancery Court was practically sustained in a decision that the railway had no right in court in seeking an injunction to prevent the alleged illegal operation of jitneys.

Because the court was equally divided in its vote on the appeal from the Chancery Court ruling, Robert H. McCarter, counsel for the company, held before the Court of Errors on Dec. 22 that "a constitutional question of great importance and affecting the right of the railway company to defend in the courts its franchise rights and privileges against illegal encroachment" has gone unanswered. Mr. McCarter said:

> By reason of the even division of the court, there is no authoritative declaration of the law, and it remains unsettled in this court where a matter of this importance should be settled, and your petitioner submits that the matter is of such great importance that there ought to be a decision in the cases that will be binding.

In his petition for rehearing Mr. McCarter pointed out that the cases were argued in the highest court during the March term and that memoranda were filed on Dec. 5 last which virtually affirmed the decree of the Court of Chancery because of the equal division. He declares, however, that one of the present judges of the court, the one that could break the tie one way or the other, was not a member of the court when argument was made and took no part in the decision.

The form Mr. McCarter took in getting the case before the court was to ask for the retention of the records in the case in the court, pending the rehearing. This was allowed upon motion of Justice Swayne. Mr. McCarter informed the court that he had filed with the sergeant-at-arms a petition for rehearing.

Separate Seniority for Safety Operators

A recent survey made by the Los Angeles (Cal.) Railway showed that in 62 per cent of a week's accidents involving safety cars the operator had worked a two-man car within a week. Twenty-nine per cent of the accidents were with cars in charge of operators who had worked on another type within twenty-four hours.

As a result of this research, all safety cars will be operated out of one division and a separate seniority list will be maintained for safety-car operators, enabling them to work on this type of car exclusively. Heretofore the safety cars have been operated out of four of the company's five carhouses.

Another step toward greater safety is being made by the Los Angeles Railway by eliminating the quarterly general choice of runs and introducing the "bid" system. The choice of runs was made according to seniority of service of trainmen, and figures of the safety bureau showed that after each choice there was an average increase of 14 per cent in accidents. This is ascribed to the fact that trainmen moved from one line to another just at the time when they were becoming familiar with the danger points and traffic conditions.

Motormen, conductors and safety-car operators made the last general choice of runs before July 1, when the "bid" system was introduced. The trainmen will hold the runs they select until a run becomes open by promotion or resignation of an employee. Then any one who wants the run may bid for it, and the man with the highest seniority will get it.

Suburban Fares Go Down in Kentucky

The Kentucky Traction & Terminal Company, Lexington, Ky., reduced fares on its suburban lines on Dec. 1. All cash fares were cut from 3.60 cents to 3.25 cents per mile, regular cash fares reduced from 3.60 cents to 3 cents per mile, and all special car rates, school tickets and commutation rates also reduced proportionately.

The new rates, given in cents, are as follows:

	Cash	Ticket
Lexington & Frankfort	90	84
Lexington & Paris	60	54
Lexington & Versailles	45	40
Lexington & Georgetown	40	35
Lexington & Nicholasville	40	35
Versailles & Frankfort	50	45

The following rates were in effect prior to Dec. 1, 1921:

	Cash	Tax
Lexington & Frankfort	$1.01	8
Lexington & Paris	0.65	5
Lexington & Versailles	0.50	4
Lexington & Georgetown	0.47	4
Lexington & Nicholasville	0.47	4
Versailles & Frankfort	0.54	4

Transportation News Notes

Tokens in Durham.—The Durham Public Service Company, Durham, N. C., will put into effect the token system of fare collection. This change is for the convenience of the patrons and for increasing the service and speed of cars.

Rehearing Scheduled.—A rehearing on the complaint of the city of Reading, Pa., against the increased fares on the lines of the Reading Transit & Light Company will be held on Jan. 3 according to a recent ruling of the Public Service Commission. In its ruling the commission has postponed the effective date of the new rates until Feb. 1.

New Schedules Deferred.—The Interstate Commerce Commission has suspended until Feb. 12 the operation of certain schedules published by the Chicago, Rock Island & Pacific Railroad and the St. Louis-San Francisco Railroad, which proposed to cancel rules providing for the absorption of switching charges assessed by the Kansas City Railways.

Wants Higher Fare.—The Sault Ste. Marie Traction Company, Saulte Ste. Marie, Mich., has petitioned the State Public Utilities Commission for a straight 7-cent fare or better. Last April the commission authorized the 7-cent fare with twenty tickets for $1. On this rate the company claims it is unable to meet expenses. It also claims a great slump in patronage.

Rehearing Granted.—The Tennessee Railroad & Public Utilities Commission has granted to the Nashville Interurban Railway a rehearing of its case, which will be heard at Nashville. The company recently filed a petition for a rehearing of its case, in which the commission ordered changes of rates and additional cars for its lines. It operates an interurban from Nashville to Franklin, Tenn., a distance of 19 miles.

Higher Fare Upheld.—The court has upheld the decision of the Public Utilities Commission in permitting the Boise Valley Traction Company, Boise, Idaho, to increase its rates on the Hill Crest loop and the Cole school line from 5 cents to 10 cents. The ruling was appealed by residents of the localities affected. Judge Reddock in his finding defended the right of the state commission to regulate and control rates. The case has been under consideration for several weeks.

Commission Reduces Special Service Rate.—In a report of the Pennsylvania Public Service Commission concerning rates charged by the Philadelphia Rapid Transit Company for operating a special funeral car, the commission holds that the charge of $25 for 4 or 5 miles is not reasonable, in comparison with a base charge of $35 for operating the same car 25 or 30 miles. In accordance with its finding, the commission ordered on Feb. 21, 1921 (report 940 just published), that the Philadelphia Rapid Transit Company reduce its rates to $45 from $60 for the service to Hillside cemetery from Philadelphia.

Legal Notes

FEDERAL DISTRICT COURT—*Federal Court Authorized to Issue Temporary Injunction Against Enforcement of Rate by State Commission.*

An uncontradicted showing that an interurban railway was losing money, though it was charging a higher rate in its interstate traffic and traffic in another state than was permitted by a state Public Service Commission's order, is sufficient, in the absence of a satisfactory explanation why the business within that state should be more profitable than the other business, to authorize a temporary injunction against the enforcement of the order prescribing the rate. The purpose of such an injunction is to maintain the status quo pending a final hearing, where the questions of law and fact are intricate and difficult and where the rights of all parties can be easily safeguarded if the injunction is wrongfully issued, while the injury to complainant would be irreparable if the injunction were wrongfully denied. [Joplin & P. Ry. Co. vs. Public Service Commission of Missouri, et al, 267 Federal Rep., 584.]

FEDERAL DISTRICT COURT — *Federal Court Cannot Fix Rate in Suit Attacking Rates Established by State Commission. Valuation on Pre-war Basis is Erroneous.*

In a suit in the federal court attacking as confiscatory rates of a public utility fixed by a state commission, the court has no rate-making power but is limited to an adjudication of the reasonableness or unreasonableness of the rate ordered. A valuation by a state public service commission of a public utility's investment, based on the original cost where that was ascertainable, and otherwise upon prices during the pre-war period, is not a reasonable method of fixing the valuation in view of the greatly increased costs since the war and of the greater rate of returns earned by other enterprises. [St. Joseph Railway, Light, Heat & Power Co. vs. Public Service Commission of State of Missouri et al., 268 Federal Rep., 267.]

INDIANA—*Last Clear Chance Doctrine Inapplicable to Passenger Standing Too Near the Track.*

An intending passenger, who took a position so near the track that he was liable to be injured and had knowledge of the approach of the car and could have retired from his dangerous position at any time before being struck, cannot recover under the doctrine of last clear chance, as the opportunity of the motorman to prevent the accident was not later in point of time than that of the intending passenger. [Union Traction Co. of Indiana vs. Smith, 127 Northeastern Rep., 308.]

MICHIGAN—*A Passenger on an Interurban Line May Assume that Tracks Intervening Between a Car and the Station Will Be Kept Safe While He Is Crossing.*

While a passenger must exercise due care for his own safety, he has a right to assume that the tracks intervening between the place where he alights from a car and the station will be kept safe while he is crossing. The mere fact that he fails to look and listen before attempting to cross does not as a matter of law constitute contributory negligence. [Terrill vs. Michigan United Traction Co., 183 Northwestern Rep., 46.]

NEW YORK—*Admission of Photograph of Mangled Body of Deceased in Death Action Manifestly Prejudicial Error.*

To admit in evidence in an action for wrongful death the photograph of the deceased lying dead in a mangled condition is error manifestly prejudicial. [Mormille vs. Brooklyn Heights Ry. Co., 183 N. Y. Supp., 87.]

NEW YORK—*Petition for Mandamus to Require Mayor to Act Need Not Show Relator Has Private Interest. Inadequacy of Car Service No Excuse for Not Enforcing Law Requiring Bus Line to Have Consent of Local Authorities.*

Petition for mandamus to compel the mayor of a city to enforce the transportation corporations law, sec. 26, so far as prohibiting bus lines operating on streets without obtaining consent of local authorities, need not show that the relator has any special interest, except that of the general public; the primary purpose of the section being protection of the streets and the local public. The operation of bus lines without the consent of the local authorities is a misdemeanor. It is no excuse for the mayor not to enforce the law mentioned that a street car company does not furnish adequate service. [People ex rel. Weatherwax vs. Wath, Mayor, 188 New York Supp., 559.]

PENNSYLVANIA—*A Motorman May Assume Pedestrian Will Avoid Danger.*

A motorman on a street car is not expected to anticipate that a pedestrian crossing the street between crossings will suddenly place himself on the track. He has also a right to believe that pedestrian will recognize superior right of travel in the car. [Gavin vs. Philadelphia Rapid Transit Co., 113 Atlantic Rep., 832.]

WISCONSIN—*Franchise Held to Permit Carriage of Freight Within City Limits.*

Where a carrier had a franchise for carrying freight to a certain street, which was the city limits, it had the right to continue carrying freight to the same street after the city limits were extended. [City of Milwaukee vs. Milwaukee Electric Railway & Light Company, 181 Northwestern Rep., 821.]

New Publications

Fire Brigades and Industrial Ventilation

Nos. 36 and 37 in the series of "Safe Practices" pamphlets issued by the National Safety Council, Chicago, Ill.

Stabilization of the Bituminous Coal Industry

Extracts from the award and recommendations of the United States Bituminous Coal Commission. 1920. 16 pp. Distributed by the Bureau of Mines in cooperation with the Council of National Defense. United States Bureau of Mines, Washington, D. C.

The Federal Water Power Act

With a history of water power legislation and a topical synopsis. Presented by Black, McKenney & Stewart, engineers, Washington, D. C.

In this pamphlet is printed an abstract from H. R. Report No. 61, 66th Congress, first session, committee on water power; a topical synopsis of the federal water power act arranged for convenient reference and the act itself.

Underground Conditions in Oil Fields

By A. W. Ambrose. Bulletin 195, Petroleum Technology 62, United States Bureau of Mines, Washington, D. C.

This compilation will be of interest to electric railway men who are dependent entirely or in part upon oil as a fuel supply, especially if they desire to be familiar with the conditions surrounding the business of oil production.

Proceedings Canadian Railway Club

Meeting of February, 1921, Montreal, Canada.

These official proceedings include the full text of the paper by D. E. Blair, superintendent of rolling stock Montreal Tramways, abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 26, entitled "Some Engineering Features of Tramway Operation," together with the discussion thereon.

Structure in Paleozoic Bituminous Coals

By Reinhardt Thiessen. Bulletin 117, United States Bureau of Mines, Washington, D. C.

This 296-page illustrated treatise on the physical characteristics of soft coal will be of interest to all coal users who wish to be informed as to the fundamental principles underlying the subject. While it is scientific in character the bulletin contains much information of a practical bearing.

Heat Transmission, Corkboard and Air Spaces

Bulletin No. 30. Pennsylvania State College, Harrisburg, Pa. 140 pages.

This bulletin is a report of work completed during the past year and a half at the thermal testing plant of the Pennsylvania State College. It includes a statement of the problem of heat transmission as applied to insulating and building materials. An extended bibliography is a part of this bulletin.

Personal Mention

Joins Mexico Road

C. K. Bowen, Engineer of the Pacific Electric, Enters the Service of Southern Pacific of Mexico

Charles K. Bowen, assistant engineer of the Pacific Electric Railway, Los Angeles, Cal., has been appointed special engineer of the Southern Pacific of Mexico, as was announced in the ELECTRIC RAILWAY JOURNAL for Dec. 10. Only recently H. B. Titcomb, former vice-president of Pacific Electric Railway, was made president of the Southern Pacific of Mexico.

Mr. Bowen will have charge of all reconstruction and new construction of Southern Pacific lines in the Southern Republic, on which work, it is understood, several million dollars will be spent almost immediately.

Mr. Bowen started service with the Pacific Electric Railway in 1903 as a draftsman. Prior to that he was with the Santa Fé Railroad.

He graduated from the Agricultural and Mechanical College of Texas as a civil engineer in 1899. Entering the Santa Fé service, he worked his way up until in 1902 he was assistant engineer in charge of construction.

In 1903 he joined the engineering staff of the Pacific Electric Railway as draftsman. From 1906 to 1908 he was chief draftsman. From 1908 to 1913 he was field engineer on location and construction. In 1913 and 1914, as acting chief engineer, he had charge of the construction of the Riverside-Colton-San Bernardino line, Riverside-Corona line, and other extension work, which cost in the aggregate several million dollars.

Several years later he was transferred to the maintenance of way department, in charge of general engineering matters.

In 1918 he was commissioned captain of engineers, U. S. Army, and attended officers' training school at Camp Humphries, Virginia. When the armistice was signed Captain Bowen was commanding officer of Company D, 81st Engineers, at Fort Benjamin Harrison. Mustered out, he resumed his connections with the Pacific Electric Railway, from which he now is going up a notch in the railroad ladder, following his former chief, H. B. Titcomb.

Mr. Bowen will be located at Tucson, Ariz.

New President of Kentucky Utilities Association

L. B. Herrington, the newly elected president of the Kentucky Association of Public Utilities, enters that position with much experience in the problems of the utilities. After serving as president of the Richmond Electric & Power Company, Richmond, Ky., Mr. Herrington joined the Kentucky Utilities Company, Louisville, Ky. He has twice represented Madison County in the Kentucky Legislature and was presidential elector from the Eighth Congressional District in 1916. Mr. Herrington is now president of the Electric Transmission Company of Virginia, operating extensively in the coal fields of Lee and Wise Counties; president of the Kentucky Light & Power Company, which operates five utilities in western Kentucky, and also vice-president in charge of operations of the Kentucky Utilities Company, which serves thirty-seven cities and towns in Kentucky and the coal fields of the southeastern and western part of the state.

John Stoll, Lexington, is the new first vice-president and W. H. Harton, general manager of Cincinnati, Newport & Covington Railway, Newport, Ky., was elected second vice-president.

Elected to Vice-Presidency

Frank Karr, Chief Counsel of Pacific Electric Railway, Was Also Made a Director

Frank Karr, who for the past seven years has been chief counsel of the Pacific Electric Railway, Los Angeles, Cal., was elected a director and second vice-president of the company at a meeting of its board of directors on

FRANK KARR

Dec. 13. Mr. Karr has been in the service of the company for many years, having been actively identified with the consolidation of the predecessor electric lines into the Pacific Electric Railway in 1911. He also handled the legal questions growing out of the period of construction immediately following the consolidation.

Since his appointment as chief counsel, he has had control of the very involved and extensive litigation that necessarily falls to the lot of a public utility company, and it is generally known in railroad circles that his unusual fairness in handling these matters has increased the railway's circle of friends and had a great deal to do with his selection for the new office.

Mr. Karr was born and reared at Hayworth, Ill. After completing his preliminary education in the Illinois State Normal School, he taught school in Illinois for four years. He came to California in 1898 and studied law at Stanford University for three years. He was admitted to the bar of California in 1901 and late that year located at San Pedro, where he was city attorney from May, 1902, until May, 1906.

Albany Operators Promoted

Ernest Murphy Becomes Assistant General Manager and R. A. Nash Superintendent of Equipment

Albert E. Reynolds, general manager of the United Traction Company, Albany, N. Y., on Dec. 7 announced the appointment of Ernest A. Murphy to the newly created position of assistant general manager in charge of the mechanical, electrical and roadway departments. Mr. Murphy has been superintendent of equipment for the company since 1917.

Mr. Reynolds also announced the promotion of Robert A. Nash, superintendent of shops, to succeed Mr. Murphy as superintendent of equipment. In creating the new position which Mr. Murphy will fill, Mr. Reynolds pointed out that the extensive territory of the traction company necessitates a vast amount of engineering work of highly technical character and the appointment of Mr. Murphy will co-ordinate the work under one head.

Mr. Murphy is well known in railroad and engineering circles and has had extensive experience. He is a graduate of Manchester Institute, England, from which he obtained degrees of electrical and mechanical engineering. He began his career with the London Metropolitan Railway and figured prominently in the electrification of the London tramways.

His first position in this country was with the Chicago Elevated Railroad, where he specialized in automatic train control and installed that system on the "L" trains. This work completed, Mr. Murphy became a member of the engineering staff of the Illinois Traction System and later assisted in equipping the Pittsburg, Harmony, Butler & New Castle Railway, Pittsburgh, Pa. Mr. Murphy was appointed superintendent of the electrical department of the Interborough Rapid Transit Company, New York, in 1913, from which position he came to Albany. As head of the equipment department of the United Traction Company, Mr. Murphy organized a car building plant which constructed a number of cars now in service on various lines. He also introduced many improvements in shop methods.

Robert A. Nash, Mr. Murphy's successor as superintendent of equipment, has been with the United Traction Company since his graduation as a mechanical engineer from Rutgers college in 1916. He has held the positions of chief inspector of equipment and superintendent of shops. During the war Mr. Nash served in the navy, graduating from the Naval School of Steam Engineering with the rank of ensign, later being assigned to the U. S. S. Cuyama as engineering officer. Mr. Nash is nationally known as a football player. As a member of Rutgers team he was Walter Camp's selection for all-American tackle for two seasons.

W. F. Finley, Jr., vice-president of the American Water Works & Electric Company, New York, was elected a manager of the American Society of Mechanical Engineers at its annual meeting held in New York in December. Mr. Finley was formerly connected with the Interborough Rapid Transit Company, New York, entering the service of the company soon after his graduation with the degree of mechani-

cal engineer from Cornell University in 1904. His first work with the Interborough was in connection with the construction of the Fifty-ninth Street power station. He later assisted in experimental and research work in connection with schemes for the development of that station and the promotion of its efficiency. In 1909 Mr. Finley left the Interborough to go into engineering work with the New England Engineering Company, and subsequently became associated with his father in commercial work, returning to the Interborough company in 1915 to take charge of the installation of turbines and of auxiliary mechanical equipment necessitated by the extensions to the subway and elevated systems. He was subsequently appointed superintendent of motor power of this company, and in addition to supervising operation of its power-generating system he had charge of the engineering and construction work coming within the scope and control of the department. In 1920 he resigned from the Interborough to become vice-president of the American Water Works & Electric Company.

Obituary

Thomas L. Childs, the sole promoter of the Canton-Akron Railway, Akron, Ohio, died recently in Akron. He was born in Leeds, England, in 1850, but came to the United States in 1864. The electric railway which he promoted is one of those which were later consolidated into the Northern Ohio Light & Traction Company.

Edward W. Fitzgerald, sixty-five years old, for many years associated with the claims department of the South Covington & Cincinnati Street Railway, Covington, Ky., died at his home in Covington, Ky., after a prolonged illness. He retired from business life last August, just about the time he was to receive an appointment in the internal revenue department in Kentucky.

John Wheeler Duntley, fifty-five years old, founder of the Chicago Pneumatic Tool Company, was killed in Chicago on Dec. 15 by an automobile truck. Mr. Duntley was one of the first men to bring pneumatic tools into use, working with Charles M. Schwab to place them on the market. He established the Chicago Pneumatic Tool Company in 1884 and was president of the company until 1909.

George Herpick, age sixty-nine, a former Indianapolis resident and for thirteen years superintendent of the old Citizens' Street Railway, died recently at his home in Miami, Fla. Mr. Herpick was born in Cumberland, Md., May 8, 1852, and spent most of his early life in that city. He moved to Indianapolis in 1878 to accept the position of superintendent of the Citizens' Street Railway. Later he was appointed Street Commissioner by Thomas Taggart, Mayor of Indianapolis, and he served in that capacity during Mr. Taggart's administration. Following that he became engaged in a general contracting business which he had founded, and later was connected with Myers & Herpick, a coal company. About a year ago he moved to Miami.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Large Copper Merger Planned

Plans for what is thought to be one of the most important mergers affecting the electrical industry in some years were announced recently when large stockholding interests of the Anaconda Copper Mining Company and the American Brass Company met in New York to discuss a merger of the latter company with the Anaconda company. This will be accomplished, according to John A. Coe, president of the brass concern, through the offering to American Brass shareholders of an opportunity to obtain in the near future an option to dispose of their holdings to the Anaconda company at $150 cash per share and three shares of Anaconda. Figuring each share of Anaconda worth $50, the transaction will involve a total payment to American Brass shareholders of $45,000,000.

This offer, it was stated, will be conditional upon the deposit of at least 51 per cent of the outstanding American Brass capital stock. The period in which these shareholders may signify their assent to the deal will probably last through January.

Representatives of the stockholders unanimously approved the merger plan, subject to working out of the details. If and when the consolidation is completed. the American Brass working organization will continue as at present.

The American Brass Company, it was stated by John D. Ryan, chairman of the board of the Anaconda company, is the largest single consumer of copper and zinc in the world, while the Anaconda is the largest single producer. American Brass in its peak year turned out 600,000,000 lb. of the metal, or 40 per cent of the country's entire output. Negotiations for the acquisition of the brass company have been going on for the past six months, he said, and a letter will soon be sent out to Anaconda stockholders, asking them to approve the transaction.

Would Settle Reparations with Electrification Material

Reports forwarded by Assistant Commercial Attaché Osborne of Rome indicate that the Director-General of the Italian State Railways is suggesting that the government have the reparations account settled in part by requiring the Germans to hand over the material which could be used in electrifying the government railways. The office of the auditor-general is said to oppose this means of settlement and to consider it preferable to have the adjustment of reparations made on a strictly money basis. Plans, according to the report, have been completed for the electrification of the Bologna-Verona-Brenner, the Pisa-Leghorn and the Venezia-Giulia lines, as well as for a shortened route between Rome and Naples. Studies are being made for the possible electrification of the Naples-Reggio, Calabria and Paola-Cosenza lines. The director of railways is negotiating with the ministry of the treasury to obtain necessary funds to carry out this extensive program. According to a report received from Commercial Attaché H. C. MacLean of Rome, the *Official Gazette* of Oct. 1 published law decree No. 1,298, whereby the State Railway administration is authorized to expend the sum of 160,000,000 lire (about $6,400,000 at present exchange) for the purchase of 120 electric locomotives.

Friction Tape Market Outlook Brighter

Signs of increasing confidence in the friction tape market are apparent and the outlook for next year is very promising. Business began to pick up well in September and with some fluctuations has continued to hold good gains since. Buying is somewhat more free. Some manufacturing is being done for factory stocks in order to make prompt shipments. Orders from abroad are gaining somewhat, Australia and other points having made commitments regardless of the exchange situation. Raw materials are more costly than earlier in the year, and some stiffening in prices is not unexpected.

Large Increase in Number of Idle Cars

Reports just received by the car service division of the American Railway Association showed that 531,337 freight cars were idle because of business conditions on Dec. 15. This was an increase of 31,689 cars within a week.

Of the total, 371,221 were surplus freight cars, cars in good repair which would be placed in immediate service if necessary, compared with 339,532 on Dec. 8, while the remaining 160,116 were idle cars which are in bad order.

Surplus box cars totaled 130,214, an increase of 8,219 compared with the total on Dec. 8 while surplus coal cars numbered 186,508, an increase of 20,445 within the same period.

Street Railway Improvements in Lyon, France

Enlargements and betterments of the trolley system of Lyon have been proposed to the Municipal Council by the Compagnie des Omnibus et Tramways de Lyon, according to an announcement in *Commerce Reports*. The estimated cost is from 35,000,000 to 40,000,000 francs. It is planned to guarantee the loan of the necessary capital by the imposition of a tax of 5 centimes on each car fare, and it is estimated the tax will bring returns of from 6,000,000 to 7,000,000 francs annually.

Railway Electrification in South Africa to Proceed

Cable advice from Trade Commissioner P. J. Stevenson, Johannesburg, South Africa, according to *Commerce Reports*, states that the railway board has decided to go ahead with the electrification of the Durban-Glencoe line at a cost of £5,000,000 ($24,332,500).

Rolling Stock

Community Traction Company, Toledo, Ohio, now has under way tentative negotiations for the purchase of fifty one-man safety cars, according to a report made on Dec. 15 by Commissioner Cann to the board of control.

Cincinnati & Dayton Traction Company, Hamilton, Ohio, has in prospect the purchase of twenty new one-man cars following the application of George P. Sohngen, receiver, in the Court of Appeals for the necessary authority to buy the new rolling stock.

Georgia Railway & Power Company, Atlanta, Ga., has furnished the following equipment details of four double-truck interurban motor cars which were ordered last year but were not delivered until several months ago:

Number of cars ordered	4
Name of road	Georgia Railway & Power Company
Date order was placed	Feb. 17, 1920
Date of delivery	May, 1821
Builders of car body	Cincinnati Car Company
Type of car	Double-truck interurban motor car
Seating capacity	60
Weight:	
Car body	21,720 lb.
Trucks	18,520 lb.
Equipment	16,000 lb.
Miscellaneous	2,500 lb.
Total	58,740 lb.
Bolster centers, length	27 ft. 0 in.
Length over all	50 ft. 0 in.
Truck wheelbase	6 ft. 6 in.
Width over all	8 ft. 2½ in.
Height, rail to trolley base	11 ft. 4 in
Interior trim	Natural cherry
Body	Steel
Headlining	Nevasplit
Roof	Arch
Equipment:	
Air brakes	Westinghouse Traction Brake AMM
Armature bearings	Sleeve
Axles	M. C. B. 6-in. wheel fit
Car signal system	Westinghouse 8 T pneumatic
Car Trimming	Dayton Mfg. Co.—Bronze, oxidized
Center and side bearings	Symington
Conduit & junction boxes	Westinghouse
Control	Westinghouse HL
Couplers	Van Dorn
Curtain fixtures	Curtain Supply Co., No. 89
Curtain material	Fabrikoid
Destination signs	Keystone
Door operating mechanism	None
Fare boxes	None
Fenders or wheel guards	Pilot, Cincinnati Car Co.
Gears and pinions	Westinghouse
Hand brakes	Dayton door handle
Heater equipment	Consolidated Car Co., Thermostat
Head lights	Ohio Brass Arc
Journal bearings	M. C. B.
Journal boxes	J. G. Brill
Lightning arresters	Westinghouse
Motors, type and number	Westinghouse 548-C-B-8, 100-hp., 4 per car
Motors, outside or inside hung	Inside
Paint, varnish and enamel	Oil and varnish
Registers	Ohmer
Sanders	Ohio Brass Co.
Sash fixtures	O. M. Edwards, Locas
Seats	Hale & Kilburn, 400 AWD
Seating material	Rattan
Slack Adjusters	Anderson
Springs	J. G. Brill
Step treads	Mason safety treads
Trolley catchers or retrievers	Knutson Retriever
Trolley bases	Ohio Brass
Trolley wheels	Sleeve wheels
Trucks	Brill 27 M. C. B.
Ventilation	Utility
Wheels	type or size 33 in steel tire

Georgia Railway & Power Company, Atlanta, Ga., has given out the following data on eight double-truck city prepayment cars which were received during 1921:

Number of cars ordered	8
Name of road	Georgia Railway & Power Co.
Date order was placed	Feb., 1920
Date of delivery	During 1921
Builder of car body	Cincinnati Car Co.
Type of car	Double-truck, double-end city prepayment
Seating capacity	48
Weight:	
Car body	16,000 lb.
Trucks	13,000 lb.
Equipment	11,000 lb.
Total	40,000 lb.
Bolster centers, length	20 ft. 6 in.
Length over all	44 ft. 6 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 1 in.
Height, rail to trolley base	11 ft. 6¾ in.
Body, wood, semi-steel, or all steel	Steel
Interior trim	Natural cherry
Headlining	Nevasplit
Roof, arch or monitor	Arch
Equipment:	
Air brakes	Westinghouse Traction Brake Company
Armature bearings (if ball or roller)	Sleeve
Axles	J. G. Brill
Car signal system	Farraday
Car trimmings	Dayton Mfg. Co., Bronze
Center and side bearings	Symington
Conduits and junction boxes	Flexiduct
Control	K-35 and K-6 with line switch
Couplers	Van Dorn 21
Curtain fixtures	Curtain Supply Co.
Curtain material	O'Bannon
Designation signs	Keystone-Hunter
Door Operating mechanism	Cincinnati Car Co.
Fare boxes	None
Fenders or wheelguards	H. B. life guards
Gears and pinions	Westinghouse
Hand brakes	Door handle
Heater equipment	Consolidated L-5 Thermostat
Headlights	Electric Service Supply Company, SR-95 Golden Glow
Journal bearings	Sleeve
Journal boxes	J. G. Brill
Lightning arresters	Westinghouse MP
Motors, type and number	Westinghouse 514-C, 40-hp. 4 per car
Motors, outside or inside hung	Outside hung
Paint, varnish or enamel	Flat color and Ry. finish varnish
Registers	Ohmer
Sanders	Ohio brass
Sash fixtures	O. M. Edwards, Bronze
Seats	Hale & Kilburn, 400-A-O-W
Seating material	Wood frame, rattan panel seat
Slack adjuster	Anderson
Springs	J. G. Brill
Step treads	Mason
Trolley catchers or retrievers	Keystone
Trolley base	Ohio brass
Trolley wheels or shoes	Wheels
Trucks	Brill 76 F.E.&I.
Ventilators	Railway Utility Company
Wheels (type and size)	Cast iron, 33 in.

Track and Roadway

Hydro-Electric Commission, Ont., Canada, will remove tracks on Wellington Avenue, Windsor to the center of the street and will repair the tracks on East Sandwich Street.

Pacific Electric Railway, Los Angeles, Cal., has been granted a permit to construct and operate certain railroad spur tracks across Mission Road and Elliott Street in Los Angeles.

Cincinnati & Dayton Traction Company, Hamilton, Ohio, is seeking authority through its receiver, George P. Sohngen, to spend $9,300 for repairs to track and equipment.

New Orleans Railway & Light Company, New Orleans, La., will relay the Carondelet tracks from Canal Street to Howard Avenue. The work will start immediately after the holiday season and will cost approximately $78,000.

Indiana Service Corporation Fort Wayne, Ind., has started extensive repairs on its Pontiac Street line in Fort Wayne. Only temporary repairs will be made this winter as the line will probably be moved in the spring.

Los Angeles (Cal.) Railway is installing a new intersection at Twelfth and Maple Streets. The Melrose track from Heliotrope to the end of the line is being rebuilt with new ties and ballast, and similar work is being done on Ascot Avenue between Vernon Avenue and Forty-eighth Street.

Municipal Railway of San Francisco, Cal., is to proceed with the construction of the Taraval and Masonic Avenue extensions of its system. The engineering department has drawn up specifications and bids are to be called for very shortly on ties, rails and other track material.

Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., will build an extension from Rushville, Ind., as soon as business conditions warrant. The Rapid Transit Commission has for some time had assurance from C. L. Henry, president of the company, that a connection would be built into Cincinnati as soon as the rapid transit loop was completed. The Henry plan is to utilize the old Cincinnati & Westwood Railway in making the connection with the loop near Brighton, a suburb of Cincinnati.

Power Houses, Shops and Buildings

Miami Beach Electric Railway, Miami, Fla., will build "courtesy stations," 20 ft. wide and 10 ft. deep, provided with seats, where there will be comfort and shelter for patrons.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has announced that it has received a contract from the city of Philadelphia, Pa., amounting to approximately $100,000 for the furnishing and installing of rotary converters and transformers for two substations on the line of the Frankfort Elevated. This equipment will be built at the East Pittsburgh works.

Professional Notes

Leo Hudson and John P. Myron have formed a partnership for the practice of engineering under the firm name of Hudson & Myron, Engineers, with offices at 808-810 Wabash Building, Pittsburgh, Pa. Mr. Hudson has been in private practice for the last fifteen years, principally on waterworks, sewerage, power plants, valuations and rates. Mr. Myron, until recently, was, for a period of over seventeen years, connected with the Pittsburgh Filter & Engineering Company as secretary and engineer.

Albert W. Smith, formerly dean of Sibley College, Cornell University, is now connected as consulting engineer with the firm of Henry R. Kent & Company, engineers and constructors, of New York and Boston. Dean Smith's work will be particularly in consulting on thermodynamics and mechanical engineer of chemical plants. He was for twelve years professor of mechanical engineering in Leland Stanford, Jr., University in California, leaving there in 1904 when he was called to Cornell as dean of Sibley College. During the interval between the resignation of President Schurman and the recent inauguration of President Farraud, about a year and a half, Dean Smith was acting president of Cornell.

Trade Notes

Combustion Engineering Corporation, New York, has opened a new branch office at 806 First National Bank Building, Pittsburgh, Pa. This office will be in charge of W. C. Stripe, formerly manager of the Philadelphia office of the company.

Wilson Welder & Metals Company has moved its general offices and Bush Terminal factory to 132 King Street, New York. Improved special equipment has been installed in the new location to enable the company to handle its arc-welding metals more efficiently. Also a room has been equipped for demonstration purposes.

Okonite Company, Passaic, N. J., manufacturers of insulated wires and cables, tape and loom, has opened a branch office at 1513 Candler Building, Atlanta, Ga. The branch is to be in charge of John L. Phillips, while E. A. Thornwell will be Southeastern sales representative. The territory served by this office includes North and South Carolina, Georgia, Tennessee, Alabama, Florida and the city of New Orleans.

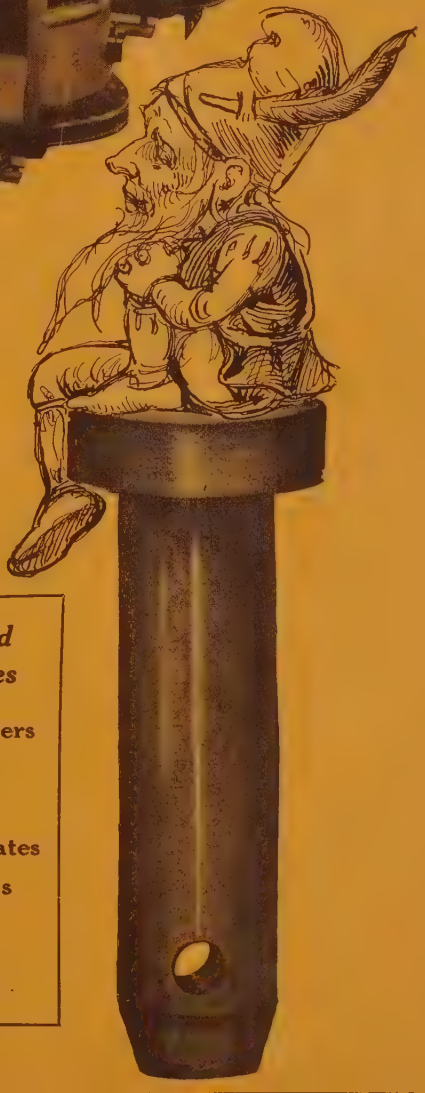
New Advertising Literature

Pawling & Harnischfeger Company, Milwaukee, Wis., has just issued Bulletin No. 4F, describing its new horizontal boring, drilling and milling machine, which was recently described in detail in this publication.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., is now distributing Catalogue 12-A, the subject of which is "Safety Switches and Panel Boards." This catalogue is illustrated with views of installations of safety switches in the shop, in the office and in the home. Some of the subjects that are discussed are the railway type safety panel boards, the safety-car lighting panels, the auto-lock control panels, the dead-front and dead-rear safety switchboards, the live-front knife switches and many other devices.

McGraw-Hill Co., Inc. December 31, 1921 Twenty Cents Per Copy

ELECTRIC RAILWAY JOURNAL



Guaranteed Not to Fail

What a source of satisfaction it must be to a railway manager to know that his "safeties" are Boyerized throughout with brake pins and bushings!

Yes, and what's more,

the largest railways in the U. S. are specifying Boyerized products because it enables them to cut down accident expense and to lower the cost of upkeep.

One trial order will convince you.

Bemis Car Truck Company
Electric Railway Supplies
Springfield, Mass.

Boyerized Specialties

Brake Hangers
Lever Pins
Bushings
Wearing Plates
Brake Heads
Door Fixture Pins

New Years Resolutions

JOE" said the Vice President, "I want to get your comments on the resolutions I have drawn up for the whole organization for the coming year. Here they are:

1. Better service to the public.
2. Full and open publicity.
3. Closer cooperation with all civic bodies in the communities we serve.
4. More scientific maintenance methods and records.
5. More scientific analysis and planning of car routes, greater use of train operation and safety cars.
6. Thorough engineering analysis on the use of trackless trolleys and auto buses as auxiliaries to our regular service.
7. Thorough business analysis of our freight haulage possibilities with Baldwin-Westinghouse electric locomotives.
8. Greater interest in the collection of data requested by our Association for the general good of the Industry.
9. Encourage our Master Mechanics and Supervisory Staff to attend Association conferences and exchange data with others.
10. Develop in our Staff greater and keener knowledge in the art of operation and maintenance, and depend on the manufacturers for material, supplies and renewal parts.
11. Continue and strengthen our policy of buying all renewal parts from the manufacturer who developed and furnished the apparatus.
12. Give preferential consideration in purchases to the manufacturer who renders us the best service.

"Boss" remarked Joe, "That's a masterpiece. It will stimulate everyone in the organization."

Westinghouse Electric & Manufacturing Co.

Sales Offices in All Large American Cities

East Pittsburgh, Pa.

Vol. 58, No. 27 New York, December 31, 1921 *Pages 1137-1166*

Electric Railway Journal

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor

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Use of Graphic Records Improves Line Maintenance

The methods employed in maintaining high-tension, trolley, telephone and signal lines on the Illinois Traction system are successful and the results obtained are highly satisfactory. Graphic records form an important part of the scheme. .....Page 1139

Selling the Employee on Salesmanship

Creating a pleasant environment, forming correct habits in car operation and developing morale are the subjects of B. R. Bigelow's remaining three talks to employees on making themselves better salesmen of transportation. Page 1143

The New Jersey Commuter in the New York Subway

The commuter traffic to New York City amounts to 359,000,000 passengers annually, of whom more than 200,000 are from New Jersey, and is growing rapidly, says Daniel L. Turner. Steps to develop a rapid transit plan are recommended. .....Page 1151

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McGRAW-HILL COMPANY, INC., Tenth Ave. at 36th St., NEW YORK

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Change of Address—When change of address is ordered the new and the old address must be given. Notice must be received at least ten days before the change takes place.

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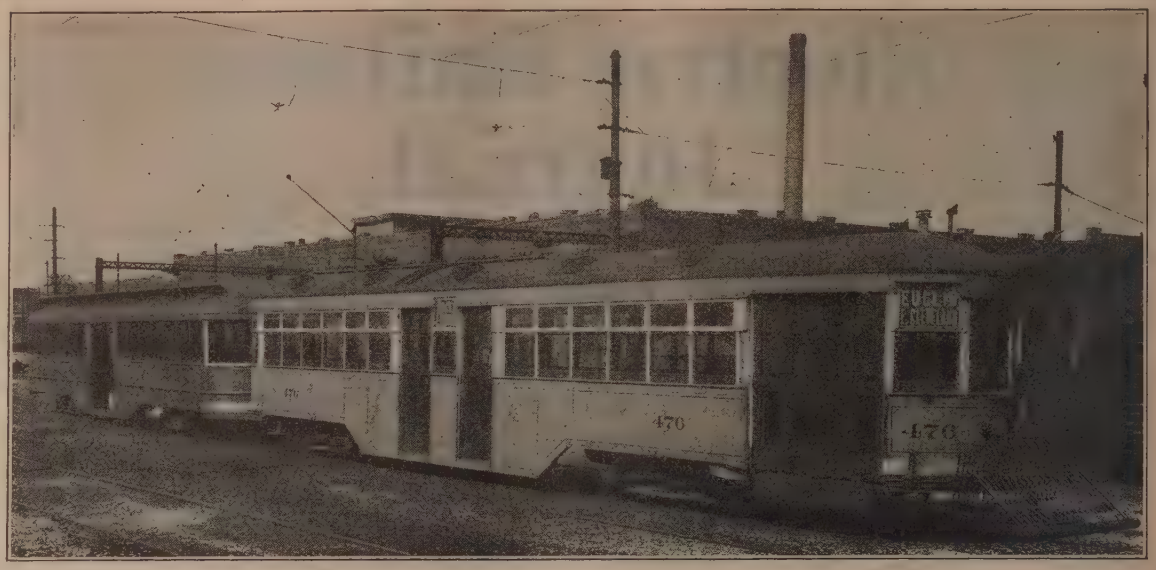


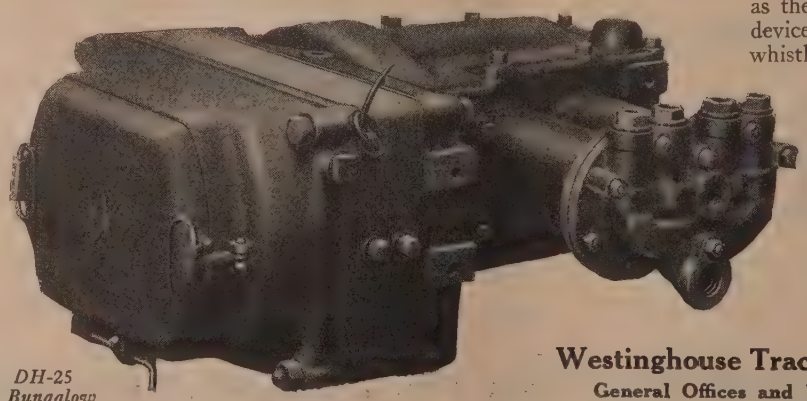
Meeting Modern Conditions

Westinghouse Bungalow Compressors were developed to meet the exigencies of street railway operation under present-day conditions.

Thus they are particularly, though not exclusively, adapted for the modern low-built car which is now generally preferred for heavy traffic lines where quick loading and unloading is an essential consideration.

In construction they combine simplicity with ruggedness, and embody new mechanical features, including a system of positive lubrication, which reduce maintenance and operating costs in a manner consistent with the prevailing urge for extreme economy.

They provide a dependable air supply sufficient in volume to meet the demand for almost constant brake manipulation in congested districts, as well as the operation of auxiliary pneumatic devices such as door engines, sanders, whistles, etc.



DH-25 Bungalow Compressor

There is a Bungalow Compressor for every class of service. For heavy cars, operated singly or with trailers, the DH-25 is recommended as a machine which has given highly satisfactory results in every instance.

Westinghouse Traction Brake Company

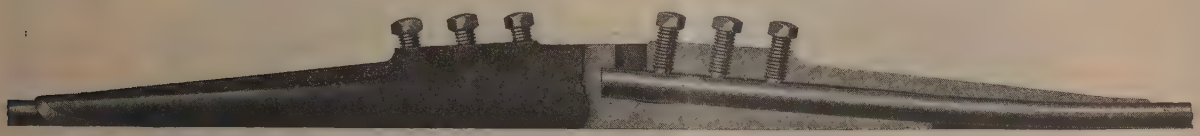
General Offices and Works: Wilmerding, Pa.

OFFICES:

Boston, Mass.
Chicago, Ill.
Columbus, Ohio
Denver, Colo.
Houston, Tex.
Los Angeles
Mexico City
St. Paul, Minn.
St. Louis, Mo.
New York
Pittsburgh
Washington
Seattle
San Francisco

WESTINGHOUSE TRACTION BRAKES

O-B Type C Splicing Ear—21 inches long—(Patented)
Shown on 2-0 Round Wire—made for all sizes of round, grooved and Figure 8 Wire.



O-B Type C Splicer—20 inches long—(Patented)
Shown on 4-0 Round Wire—made for all sizes of round, grooved and Figure 8 Wire and to take two kinds of wire.

More life, more strength, more value in O-B Improved Type C Splicers

O-B Patented Approach

Before Peening — Wire Installed

Expect more than ever from Improved Type C Splicers—there's more value in them.

Metal has been added to the running surface—and added with scientific certainty. Enough wearing section has been provided to make the Improved C last as long as the wire. The amount of metal to be used was determined by a comparison of the physical characteristics of splicer bronze and hard drawn copper wire based on Brinnell hardness tests. A ratio was established which gives the necessary wearing life to the splicer as compared with the trolley wire itself.

Extra metal has not changed, at all, the straight away wire entrance which has always distinguished the O-B Type C. Trolley wire still enters without kink. Because the wire enters straight, a shorter approach has been made possible. This adds life and increases even more the speed of installation which is one of the main virtures of the Type C.

There have also been added to the Improved Type C, peep holes which show when the wire is clear in.

O-B Improved Type C Splicer has holding power greater than the strength of the trolley wire. It has a low center of gravity—stands upright in the span.

Worn wire can be kept in service by the Improved Type C which requires no kink and which is easy on the trolley. It has the patented O-B approach—a straight smooth underrun. Wheel clearance is excellent.

Prompt shipment.

The Ohio Brass Co.
Mansfield, Ohio, U.S.A.

MEMBER A.E.R.A. 1921

New York Philadelphia Pittsburgh Charleston, W.Va. Chicago Los Angeles San Francisco Paris, France
Products: Trolley Material, Rail Bonds, Electric Railway Car Equipment, High Tension Porcelain Insulators, Third Rail Insulators

Factors Which Govern the Proper Selection of Rail Joints in Paved Streets

Forest Hills, Mass., where Thermit Insert Welds installed nine years ago are still in excellent condition.

10—Co-operation of Rail Welding Service Organization

We have spared no efforts to build up an organization, composed of experienced track engineers, which can be called on at any time to render service and advise in all matters regarding the

THERMIT INSERT RAIL WELD

The weld which absolutely eliminates the joint, prevents cupping at this point and cuts out maintenance costs.

Our organization is also at your service for giving expert instruction in—

1. Constructing Thermit welded frogs and crossings.

2. Welding broken electric motor cases, car truck frames and the many other invaluable uses for Thermit in the shop.

Our customers are urged to take full advantage of this opportunity for free service and instruction, as we realize fully that their interests and our interests are identical. In dealing with the Metal & Thermit Corporation you are dealing with a concern whose interest in your welfare does not cease when the order is obtained; our interest only really begins at that point and you can count on our continued efforts and earnest co-operation to turn that order into one of the most profitable investments you ever made.

Send for our latest Rail Welding Pamphlet 3932

SERVICE STRENGTH THERMIT WELDING ECONOMY

Metal & Thermit Corporation

120 Broadway, New York

PITTSBURGH CHICAGO BOSTON S. SAN FRANCISCO TORONTO

SERVICE STRENGTH THERMIT WELDING ECONOMY

Who Uses Steel Twin Ties and Why

Save $16573.60 per mile.

"The completed track showed a saving of $3.12 per single track foot."— Mr. A. J. Stratton in The Electric Railway Journal.

Labor Costs Less With Steel Ties.

"Use of Steel Ties cuts down the amount of grading both in width and depth."—Mr. W. R. Dunham, Jr., in Maintenance of Way for Street Railways.

Track Laid in 1911 in Excellent Condition.

"There is difficulty now in finding these joints and not a single joint has given trouble."—Mr. A. S. Wolfe in The Electric Railway Journal.

Partial List of Cities in which Steel Twin Tie Track has been laid or is being laid this spring.

New Haven, Conn.	Toledo, Ohio
Harrisburg, Pa.	Youngstown, O.
Poughkeepsie, N. Y.	Cincinnati, O.
Boston, Mass.	Jackson, Mich.
Syracuse, N. Y.	Pueblo, Colo.
El Paso, Texas	Denver, Colo.
Milwaukee, Wis.	Salt Lake City, Utah
Baltimore, Md.	Charlottesville, Va.
Cleveland, O.	Birmingham, Ala.
Detroit, Mich.	Lexington, Ky.
Highwood, Ill.	Louisville, Ky.

THE INTERNATIONAL STEEL TIE COMPANY, CLEVELAND, OHIO

International Products:—STEEL TWIN TIES; STEEL CROSSING FOUNDATIONS; and STEEL PAVING GUARD; are manufactured and sold for us in Canada by The Sarnia Bridge Co., Ltd., Sarnia, Ont.

Steel Twin Tie Track

Insurance plus Marsh & McLennan Service

Representatives

Representatives of Marsh and McLennan act as your confidential insurance advisers. They are men who have the confidence and the standing among insurance companies to plead your case, whenever they are satisfied that your rates are not a true measurement of relative fire hazards.

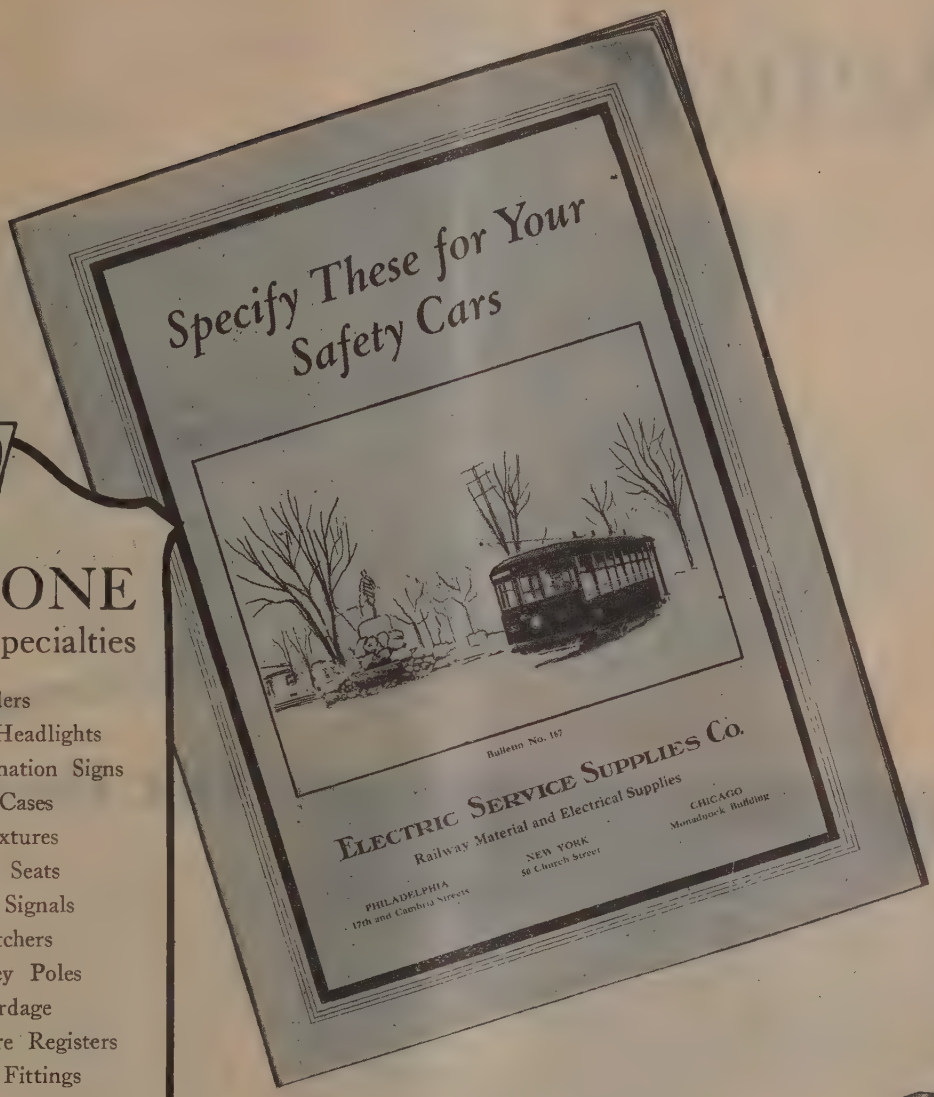
The service which Marsh and McLennan can render you is consistent with the service your legal advisers render. Do you place your insurance with the same care?

MARSH & McLENNAN

175 W. Jackson Blvd. Chicago, Ill.

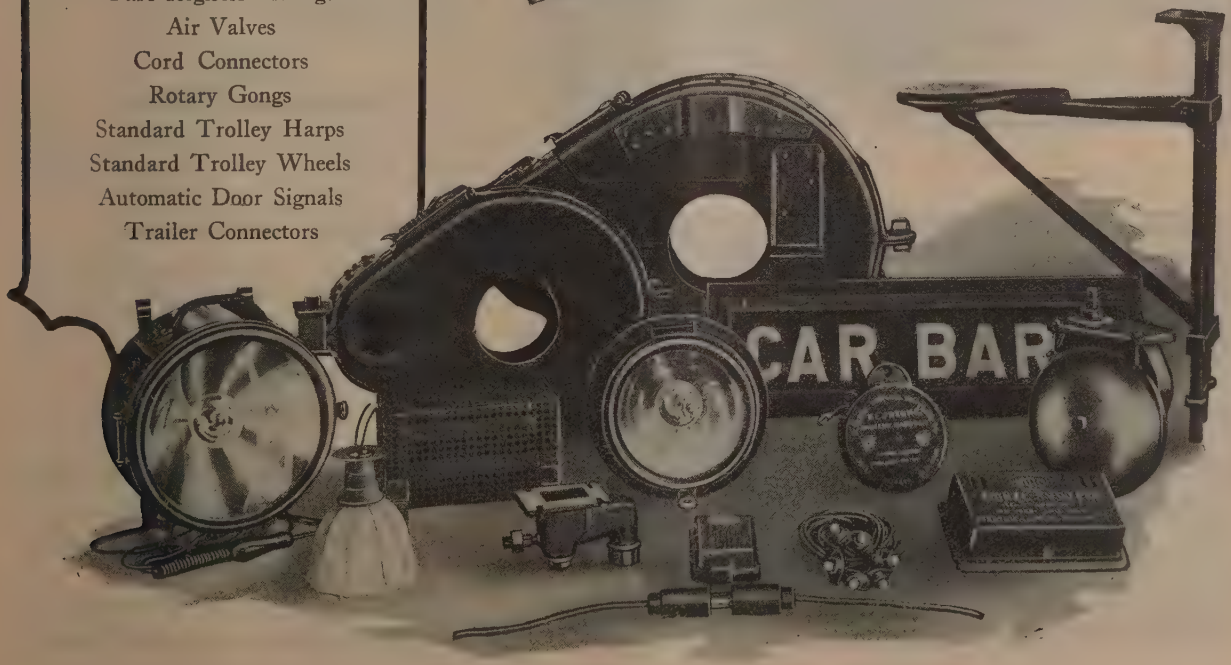
Minneapolis
New York
Detroit
Denver
Duluth
Columbus
San Francisco
Seattle
Cleveland
Winnipeg
Montreal
London

Send for the book

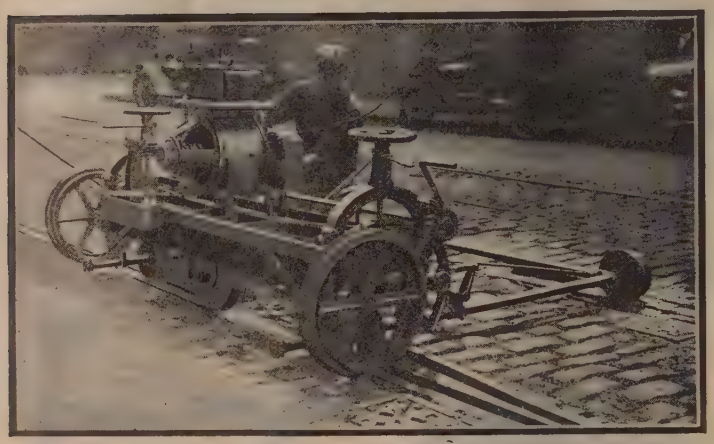


KEYSTONE
Safety Car Specialties

Air Sanders
Golden Glow Headlights
Illuminated Destination Signs
Steel Gear Cases
Lighting Fixtures
Motormen's Seats
Faraday Car Signals
Trolley Catchers
Shelby Trolley Poles
Samson Cordage
International Fare Registers
Fare Register Fittings
Air Valves
Cord Connectors
Rotary Gongs
Standard Trolley Harps
Standard Trolley Wheels
Automatic Door Signals
Trailer Connectors



Action!



Get Busy Now!

Don't delay that track rehabilitation any longer!

The public now expects better quality service and the rubber-tired motorbus looks pretty good in some places. Start putting your tracks in shape at once. Extra gangs can be employed now at reasonable wages and additional highest-grade welding and grinding equipment can be secured at attractive prices and for quick delivery.

AJAX
Electric Arc Welder

A 155 lb. high capacity resistance welder, especially designed and built for efficient maintenance of railway track.

ATLAS Rail Grinder

An efficient rotary grinder, high speed, light and suitable for working under heavy traffic conditions.

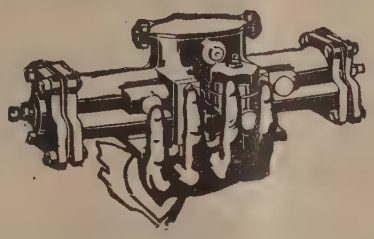
RECIPROCATING
Track Grinder

Unsurpassed for removing all trace of corrugations from straight and curved track.

RAILWAY TRACK-WORK CO.
3132-38 E. Thompson St.
Philadelphia, Pa.

AGENTS:
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
Atlas Railway Supply Co., Chicago
P. W. Wood, New Orleans

Modernize! ? *Pneumatize!*



Been to an Auto Show Lately?

How many hand-cranked cars did you see?

Not many, if any.

Seems foolish even to mention hand-cranking to-day, eh?

You know, we know, the people know this is the Automatic Age.

But how about the street cars in which you want to keep carrying those people for their every-day doings?

Are those cars still hand-stepped, hand-doored, hand-signalled?

If so, they're not going to "pull" people of the Automatic Age, are they?

Can we give those cars the pulling power they need?

We can, and to whatever degree of automatizing and pneumatizing your conditions may require.

Just tell us what kind of cars you have and the jobs you use 'em for so we can get together on your choice of:

National Pneumatic

Door and Step Control — Door and Step Operating Mechanisms
Motorman's Signal Lights — Safety Interlocking Door Control
Multiple Unit Door Control

Then, and then only, will you have YOUR 1922 car for a 1922 public!

Manufactured in Canada by
Dominion Wheel & Foundries, Ltd.
Toronto, Ont.

National Pneumatic Company, Inc.
50 Church St., New York — Edison Bldg., Chicago
Works: Rahway, N. J.

WHEN RAILWAY MEN

in general, study the question of *wood durability* for other purposes, as carefully as *Railway Signal* men have studied it for *Trunking* and *Capping*, there will be a lot more

"ALL-HEART"
"TIDE WATER"
CYPRESS
"THE WOOD ETERNAL"

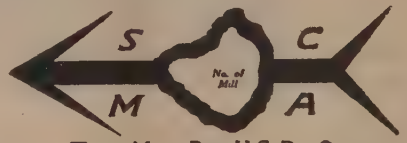
used for *Fencing, Ties, Crossarms, Car Material, Station Construction* and similar railroad requirements, *to the very great economy of the companies using it.*

The long service which *"All-Heart" Cypress* gives,

SAVES LABOR COSTS
FOR RENEWALS AND
REPLACEMENTS

—big items in themselves.

"All-Heart" Cypress comes nearer being decay-proof than any other wood.

This Mark 

TRADE MARK REG. U.S. PAT. OFFICE

on every timber, board and bundle of Cypress is your *insurance of true replacement economy.*

The data in support of these facts will be promptly furnished upon request.

Southern Cypress Manufacturers' Association

1265 Poydras Building
New Orleans, La.

or

1265 Graham Building
Jacksonville, Fla.

"SHELBY"

SEAMLESS STEEL TROLLEY POLES

Reinforced where reinforcement is needed, without adding superfluous weight or sacrificing resiliency.

THE standard "SHELBY" Poles are made from 13 gauge material, as years of practical experience have shown that a lighter gauge may fail by local injuries, and a heavier gauge simply adds to the weight of the pole without increasing its strength to a corresponding extent. The theoretical requirement for a pole of minimum weight points out a method for increasing the strength of the pole without a proportionate increase in the weight. This method consists of the use of a reinforcement at the base end and on the inside of the 13 gauge member.

Recent improvements have been made in the methods of manufacture, particularly in the method of inserting the reinforcement. As now made, the reinforcement is integral with the body of the pole, which adds materially to its efficiency.

Ask for Booklet—The "SHELBY" Seamless Cold Drawn Steel Trolley Pole.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

General Sales Offices: Frick Building

DISTRICT SALES OFFICES

Atlanta Boston Chicago Denver Detroit New Orleans New York Salt Lake City Philadelphia Pittsburgh St. Louis St. Paul

PACIFIC COAST REPRESENTATIVES: U. S. Steel Products Company San Francisco Los Angeles Portland Seattle

EXPORT REPRESENTATIVES: U. S. Steel Products Company New York City

Positive Proof from Progressive Properties Proves the Superiority of TULC

We don't ask you to accept Tulc, on your property, just because it has proven that it is superior to all other lubricants on other progressive properties.

The secret of our success has been due to the *individual, special* and *concentrated* lubrication service that is back of every sale and which is an integral part of our sales policy.

We believe in the importance of personal service intelligently rendered. We maintain a highly efficient specialized organization who base their calculations on tests made on your property.

It is on our past reputation, our broad experience and the large number of railways that are using our product and our service that we ask you to let us tell you how we can improve your present methods of lubricating and decrease your labor and maintenance expense.

The Universal Lubricating Co.

Offices: Schofield Bldg. Works: Sweeney Ave.

Cleveland, Ohio

TULC A LUBRICANT

—scientifically and accurately compounded to reduce lubricating costs

Standard Helical Gears

Ground Pinion Bores
assure a correct fit on armature shaft and prevent injury to the shaft taper.

The Big Four

1—Drop Forged Pinion Blanks
2—Nuttall Workmanship
3—7½ deg. Standard Helical Teeth
4—BP Treatment

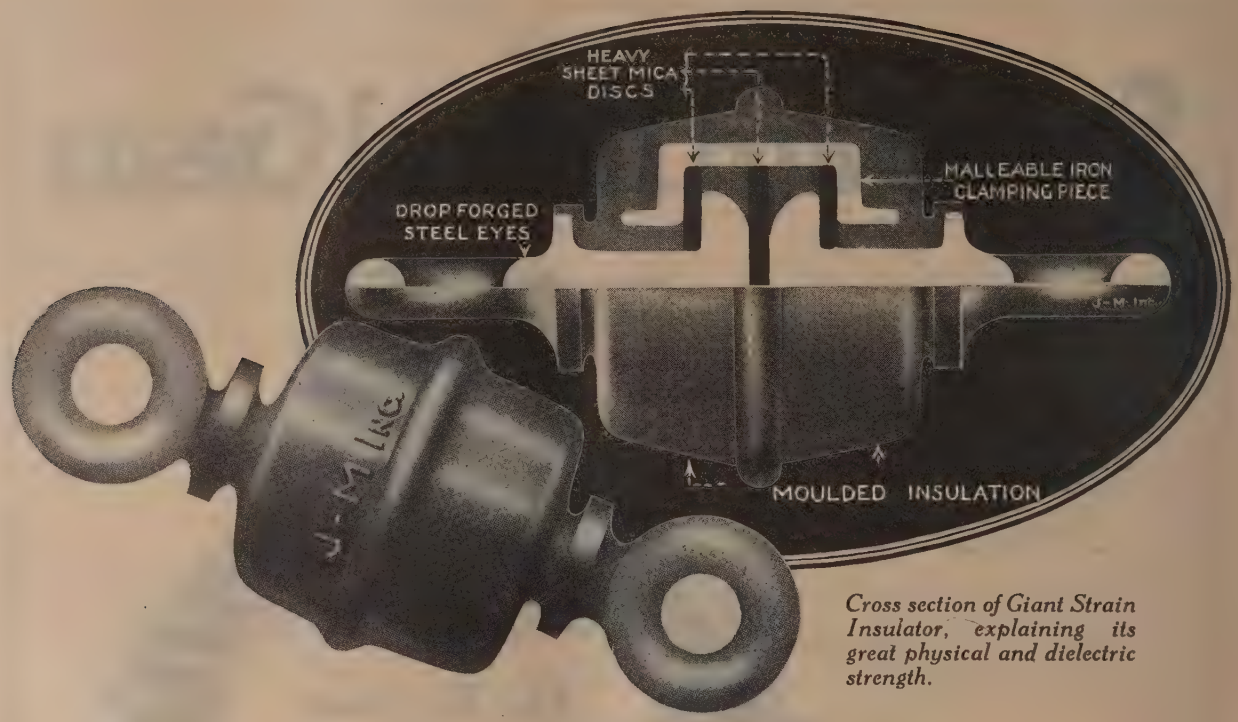
Forged Steel Gears cost more to buy, but less to operate.

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric and Mfg. Co. District Offices are Sales Representatives in the United States for Nuttall Electric Railway and Mine Haulage Products.

In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Nuttall



Cross section of Giant Strain Insulator, explaining its great physical and dielectric strength.

Put a Giant on the Job

OUT in all kinds of weather, often subjected to blows from trolley poles or acting as targets for small boys—if there's any job that takes physical and electrical strength, it's the work a strain insulator has to do.

That's why thousands of Giants are on the job—for a Giant Strain Insulator 2⅝ in. diameter and 4⅛ in. center to center of eyes has an average breaking strain of 11,500 lbs.

Ask the nearest Johns-Manville branch for the booklet that gives complete details about Giant Strain Insulators.

JOHNS-MANVILLE
Incorporated
Madison Ave., at 41st., New York City
Branches in 60 Large Cities
For Canada:
CANADIAN JOHNS-MANVILLE CO., Ltd.,
Toronto

JOHNS-MANVILLE SERVICE COVERS THE CONTINENT

Through
ASBESTOS
and its allied products
Electrical Materials
Brake Linings
Insulations
Roofings
Packings
Cements
Fire Prevention Products

JOHNS-MANVILLE ELECTRICAL MATERIALS

Testimonials That Count

Cost Records!

"Why keep records of mileage, lubricants used, and the like?" exclaims the salesman of the "good as Galena" oils. "It is expensive and unnecessary. Buy our oils on a straight gallonage basis, and save this useless trouble and expense."

Reasoning that comes straight from the heart! The cost record is truly a stumbling block to the use of inferior materials — their *real cost* is then bound to show. Where no cost records are kept, cheap oils can "get by", and claim a saving on every gallon used. But this little joker has a disagreeable habit of showing conditions as they really are. Modern business efficiency will permit of no lopsided bookkeeping; it is just as essential to know the details of expenses as receipts.

It is the authentic figures of cost records on hundreds of electric railways that testify to the economy of GALENA OILS. They show that the gallon of Galena gives about double the mileage of other oils; that repairs and replacements of bearing parts are kept at a minimum, through their protective ability; that the time losses and annoyances due to hot boxes practically disappear.

The evidence of the cost record is the testimony that counts. Its figures show not only the cost of *oils*, but the cost of *lubrication*. And surely it is lubrication service — not oil — that the railway uses.

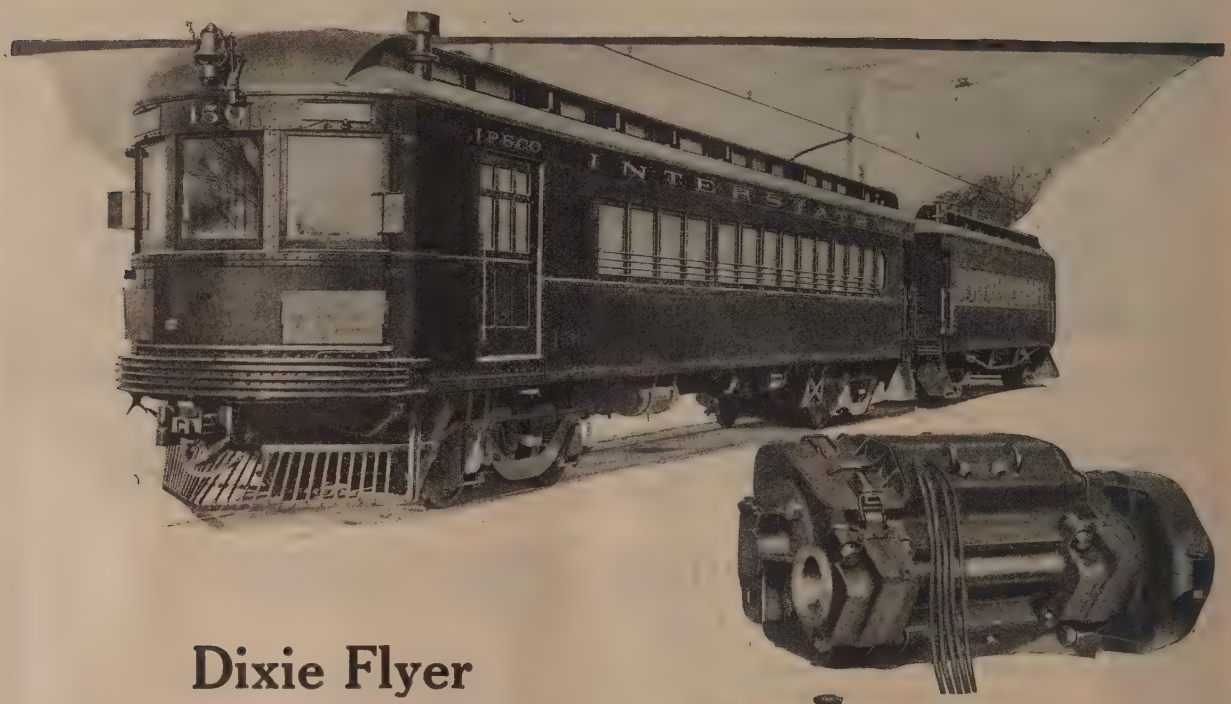
Galena Quality Is Our Bond and your Security!

Galena-Signal Oil Company

New York - Franklin, Pa. Chicago

and offices in principal cities

Today interurban electric lines, properly equipped, can successfully compete with steam railroads



G-E 254 Motor

Dixie Flyer

THE Interstate Public Service Company has recently equipped its lines with the most modern high speed cars, designed to provide maximum passenger comfort and to make the run between Indianapolis and Louisville with a material saving in time over the fast steam trains.

General Electric substations, G-E-254 motors and PC-12 control are contributing to the success and reliability of this service.

Master Controller

Motor Controller with cover off

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

25-107

PEACOCK URGES

Try the Life-Boats!

Consider the Sailor's Ways

Maritime rulings very wisely require frequent drills on shipboard. At specified intervals, though the sea may be calm and the sky all clear, the call is given to man the life-boats. Then every jack-tar learns to hop to his station, tackles are tested and gear is over-hauled. Why? To be sure that "Jack" will know his job, and to ensure that blocks won't jam when a real emergency comes.

Would Your Motorman "Abandon Ship"?

How about your own case on dry land? Does Motorman "Jack" know what to do if his air-brake fails? Will he shift to his hand-brake with the quick precision of a well-trained blue-jacket? Or will he "abandon ship" by jumping panic-stricken over-side?

And if he does try to use his hand-brake—will it work? There's the rub!

Why not make a standard practice of one hand-brake stop on every trip, at some specified point? Then you will be sure that your men are trained and familiar with the equipment. And you will soon find out whether the hand-brake equipment will work satisfactorily or not. Your motormen will tell you in plain unvarnished words of one syllable, what they think of it.

If hand brakes are unsatisfactory, let's figure on Peacock equipment. The first cost is not great, and the results in safety and economy of maintenance will pay generous returns on the investment.

The Peacock Staffless

National Brake Company, Inc.

890 Ellicott Sq. Buffalo, N. Y.

Bankers and Engineers

Ford, Bacon & Davis

115 BROADWAY, NEW YORK

Detailed Examinations by Experts

REPORTS FOR FINANCING COVERING

Valuation Turnover

Costs Reserves Rates

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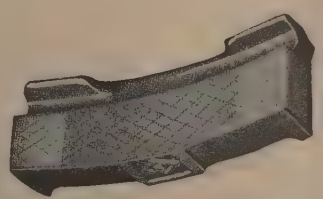

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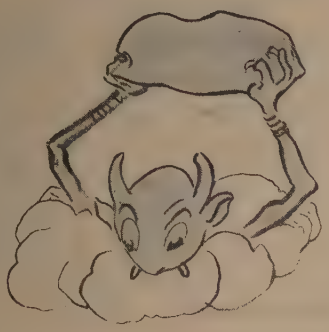

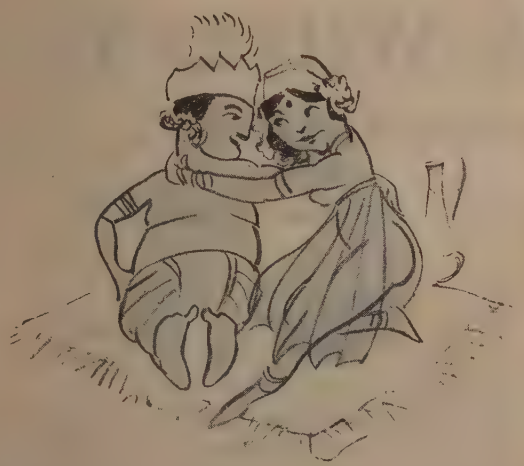

In the altar of every Persian temple is set a brick-shaped stone, jet black in color.

Although scientists declare these stones to be aerolites, tradition has it that they came direct from heaven, *suffaith*, or whiter than milk in color, and that they were turned black by the sins of those who touched them; further, that on the Day of Judgment these stones would speak and would bear witness in favor of, or against, the folks who kissed them.

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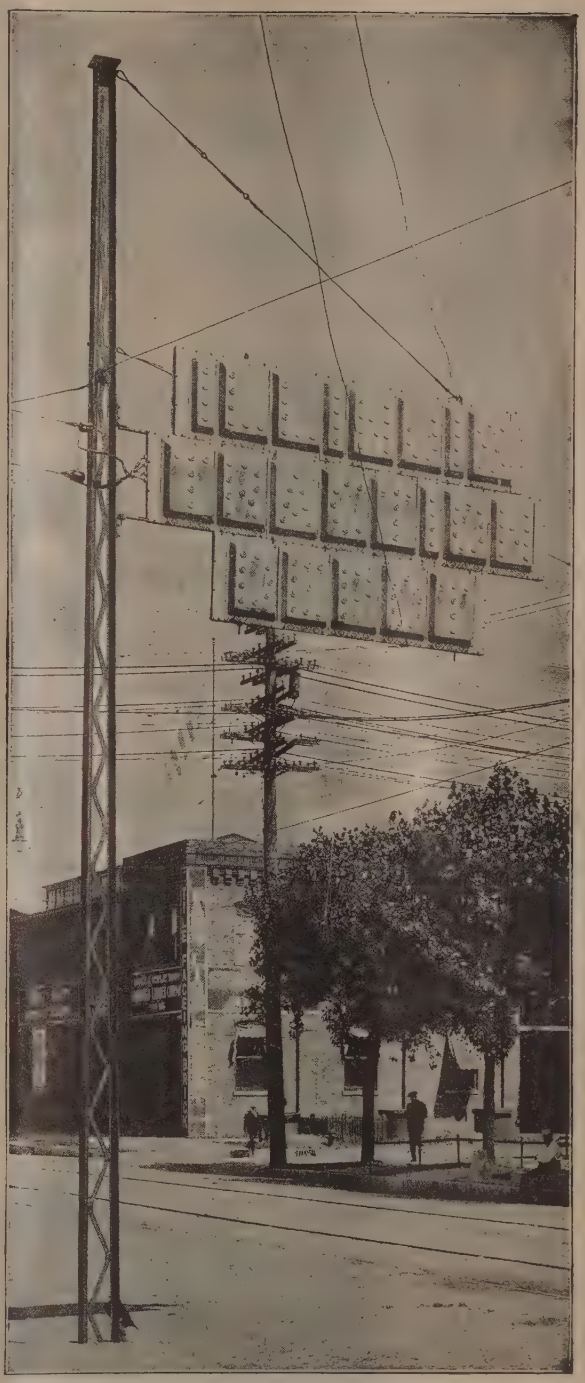

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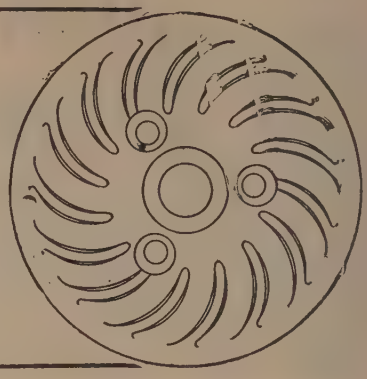

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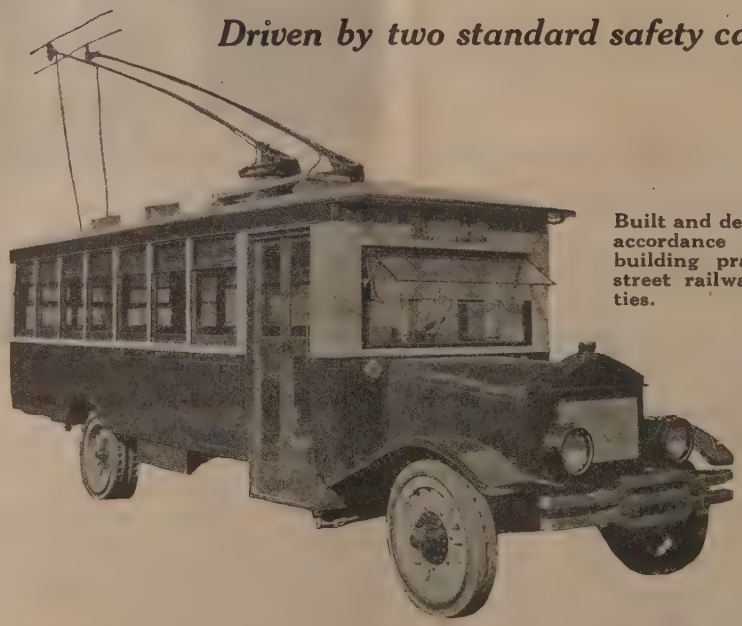

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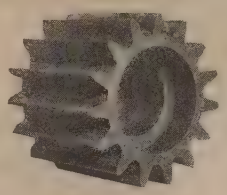

The "Tool Steel" pinion wore out after 239,136 miles.

Special quenched pinions wore out in 50,000 to 60,000 miles.

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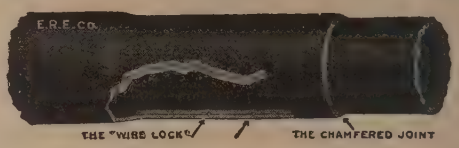

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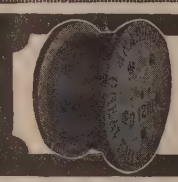

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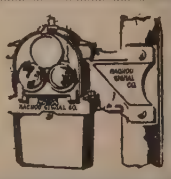

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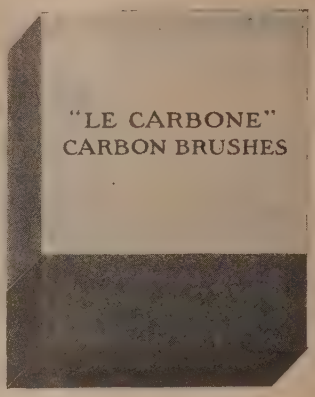

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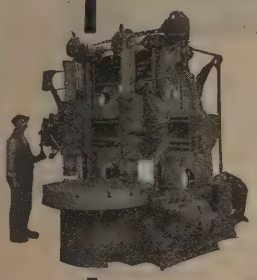

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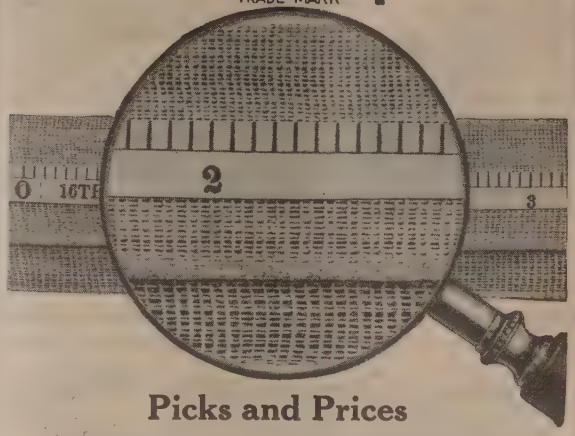

Picks and Prices

This unretouched photograph shows Beldentape and two other brands of electrical tape magnified to two diameters. Beldentape has 40 threads, called picks, to each inch of length and 80 threads, warps, to each inch of width. The others are 30 x 72 and 26 x 60.

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Alliance, Ohio

WE-FU-GO AND SCAIFE WATER

PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

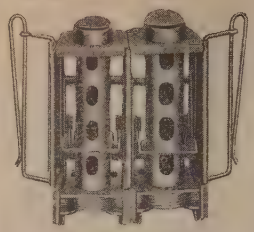
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

FORD TRIBLOC

A Chain Hoist that excels in every feature. It has Planetary Gears, Steel Parts, 3½ to 1 factor of Safety. It's the only Block that carries a five-year guarantee.

FORD CHAIN BLOCK CO.
Second and Diamond Sts., Philadelphia

JOHNSON Universal Changer



Adjustable

The only changer on the market which can be adjusted by the conductor to throw out a varying number of coins, necessary to meet changes in rates of fares.

Flexible

Each barrel a separate unit, permitting the conductor to interchange the barrels, to suit his personal requirements and to facilitate the addition of extra barrels.

JOHNSON FARE BOX COMPANY
Ravenswood, Chicago, Ill.

Waterproofed Trolley Cord

Is the finest cord that science and skill can produce. Its wearing qualities are unsurpassed.

FOR POSITIVE SATISFACTION ORDER SILVER LAKE

If you are not familiar with the quality you will be surprised at its ENDURANCE and ECONOMY

Sold by Net Weights and Full Lengths

SILVER LAKE COMPANY
Manufacturers of bell, signal and other cords.
Newtonville, Massachusetts

Reduce Commutator Wear and Losses Due to "Tie-Ups"

To be absolutely safeguarded against excessive commutator wear—assured of real mileage day in and day out—and to obtain lower operating costs, use

National Carbon Brushes

the brushes that were made to suit the commutator and the service.

You name the job—we'll name the brush

National Carbon Company, Inc.
Cleveland, Ohio

B. A. Hegeman, Jr., President
Charles C. Castle, First Vice-President
Harold A. Hegeman, Vice-Pres. and Treas.
W. C. Lincoln, Mgr. Sales & Engineering
Fred C. J. Dell, Secretary

National Railway Appliance Co.
50 East 42nd St., New York City

Hegeman-Castle Corporation
343 So. Dearborn St., Chicago, Ill.
National Railway Appliance Co.
Munsey Bldg., Washington, D. C.
National Railway Appliance Co.
Little Bldg., Boston, Mass.

RAILWAY SUPPLIES

Tool Steel Gears and Pinions
Anderson Slack Adjusters
Genesco Paint Oils
Dunham Hopper Door Device
Feasible Drop Brake Staffs
Flaxlinum Insulation
Anglo-American Varnishes, Paints, Enamels, Surfacers, Shop Cleaner
Johnson Fare Boxes
Perry Side Bearings
Drew Line Material and Railway Specialties
Hartman Centering Center Plates
Economy Power Saving Meters
H & W Electric Heaters
Garland Ventilators
Pitt Sanders
National Safety Car Equipment Co.'s One-Man Safety Cars
Central Equipment Company's Hand Holds

Cleveland Fare Boxes

have no bolts, nuts or screws, that can be removed from the outside. Let us tell you of other good features.

Let us explain.

The Cleveland Fare Box Co.
Cleveland, Ohio
Canadian Cleveland Fare Box Co., Ltd.
Preston, Ontario

PROVIDENCE H-B
FENDERS LIFE GUARDS

The Consolidated Car Fender Co., Providence, R. I.
Wendell & MacDuffie Co., 61 Broadway, New York
General Sales Agents

N-L

Indicating Signals
Mechanical Sanders
Ventilators, Smokestacks
Pneumatic Sanders
Selector Switches, Lanterns, etc.

THE NICHOLS-LINTERN CO.
8404 Lorain Ave., Cleveland, Ohio

SAMSON SPOT WATERPROOFED TROLLEY CORD

Trade Mark Reg. U. S. Pat. Off.
Made of extra quality stock firmly braided and smoothly finished. Carefully inspected and guaranteed free from flaws. Samples and information gladly sent.
SAMSON CORDAGE WORKS, BOSTON, MASS.

KASS SAFETY TREADS

Lowest initial and upkeep costs. Cannot break or disintegrate. Positively anti-slipping. Used by more than 100 steam and electric railway systems.

Manufactured and Sold by
Morton Manufacturing Company
CHICAGO, ILL.
Let us send to you our Bulletin No. 6

HORNE MANUFACTURING CO.
Mercer and Colgate Streets, Jersey City, N. J.

Hand Brakes—Air Purifiers for Compressors—Lighting Fixtures—Electric Vibrating Bells—Thermostats—Switches, Receptacles and Plugs—Junction Boxes, Portables and Reflectors.

Heating and Ventilating

Let us demonstrate to you how we can heat and ventilate your cars at the lowest possible cost.

The Cooper Heater Company
Carlisle, Pa.

ELECTRIC RAILWAY JOURNAL

Think "SEARCHLIGHT" First

ADVERTISING RATES

POSITIONS VACANT—Business Opportunities and other undisplayed ads, 8 cents a word, minimum $2.00 an insertion.

POSITIONS WANTED—Evening work wanted, tutoring and other undisplayed ads of individuals looking for employment, 4 cents a word, minimum 75 cents, payable in advance.

ADD 5 WORDS for box number in undisplayed ads if replies are to any of our offices. There is no extra charge for forwarding replies.

DISCOUNT OF 10% if one payment is made in advance for 4 consecutive insertions of undisplayed ad.

ADS IN DISPLAY TYPE—Space is sold by the inch (30 in. to a page), the price depending upon total space used within a year, some space to be used each issue.

RATE PER INCH for ads in display space:

1 to 3 in., $4.50 an in.	15 to 29 in., $3.90 an in.
4 to 7 in., $4.30 an in.	30 to 49 in., $3.80 an in.
8 to 14 in., $4.10 an in.	50 to 99 in., $3.70 an in.

POSITIONS VACANT

ROADMASTER wanted to take charge of city and interurban railway tracks in middle western city. Must have had experience in brick paving and special work. P-373 Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

TECHNICAL graduate of experience wanted, to take charge of Engineering Department of Electric, Gas and Street Railway. Send photograph, state age, education, qualifications and salary desired. P-375 Elec. Ry. Journal, Old Colony Building, Chicago, Ill.

Unusual opening for Superintendent of Transportation with New England Street Railway Company, in community of 100,000 population

Technical man wanted who can qualify for the above position. Preference will be given to applicant who is not over 35 years and married. Good living conditions, modern equipment, union labor and Company is in excellent financial condition. Man wanted who can handle problems outside his departmet and who can eventually work up into position of Assistant General Manager.

Opportunity for advancement unlimited for man of ability who can take his place in the community and go ahead with a progressive company.

Give full details of past experience, references, salary, and state when available. Reply to:

P-368, Electric Railway Journal
10th Ave. at 36th St., New York City

"SEARCHLIGHT" IS Opportunity Advertising

—to help you get what you want.

—to help you sell what you no longer need.

Take Advantage Of It

For Every Business Want

"Think SEARCHLIGHT First"

0167

In Replying to "Blind" Ads

be careful to put on envelope the key number in the ad and also local address of office to which reply is sent.

10th Ave. at 36th St., New York.
935 Real Estate Trust Bldg., Phila.
533 Leader-News Bldg., Cleveland.
1570 Old Colony Bldg., Chicago.
531 Rialto Bldg., San Francisco.

Important

Original letters of recommendation or other papers of value should not be enclosed to unknown correspondents — send copies.

0195

POSITIONS WANTED

INDUSTRIAL engineering, maintenance or construction. Ten years superivision on construction and maintenance of buildings, power plants and equipment. Seven years betterment work, on production, organization, appraisals, costs. Age 35. PW-374 Elec. Ry. Journal.

SUPERINTENDENT of transportation, with a proven record of seventeen years on large city and interurban properties, desires a change. Capable and progressive with high grade references as to character and ability. Capable of taking over details of trasportation of any property and getting results. PW-360, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

SUPERINTENDENT of Transportation with a proven record of 17 years on large city Suburban and Interurban properties desires a change and will consider any good size city and suburban property that requires a practical superintendent of wide experience. Capable of handling all details of transportation and getting results from employes. Personal reasons for desiring a change. High grade references. PW-372, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

SALESMEN AVAILABLE

HIGH grade electric specialty salesman, either street railway or general supplies. Traveling out of Chicago preferred. At liberty Jan. 1. AS-371, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

For 20 Years

we have been
Buying and Selling

Second-Hand Cars

Trucks and Motors

At Your Service

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa

A Good Purchase

6—Sets Sprague Multiple Unit Control, together with large number of repair parts that are new and which can be purchased at a low price and effect a large saving.

2—Second-Hand K 14 Controllers with large number of repair parts.

Let us have you inquiries.

A. W. MUNSTER
Purchasing Agent Boston & Maine R.R.
Room 142 North Station, Boston, Mass.

USED CARS

For Every Service

Railway Motors

Standardize Your Equipments at Minimum Cost

TRANSIT EQUIPMENT CO.
501 Fifth Avenue, New York

ROTARY CONVERTERS

1—2200 KW. Westinghouse 6 phase, 60 cycle, A.C., 600 volt D.C. with speed limit and end play device, speed 450 R.P.M. and 3-900 KVA. 13200/6600-368 volt transformers and panels complete.
1—1000 KW. Westinghouse 6 phase, 60 cycle A.C. 600 volt D.C. speed 900 RPM. complete with 1000 KW. 3 phase, 60,000 volt transformer with 5 and 10 per cent taps, also A.C. and D.C. switchboard panels.
2—300 KW. Stanley 3 phase, 25 cycle, 360 volts A.C., 600 volt D.C. speed 500 RPM. complete with suitable transformers, also panels.

DIRECT CONNECTED ENGINE UNIT

1—850 KW. Gen. Elec. 575 volt compound wound 100 RPM. generator direct connected to 23 and 54 x 48 Greene Wheelock cross compound heavy duty 4 valve engine complete with Surface Condensing equipment and panel, price f.o.b. cars.....$9,500

Archer & Baldwin, Inc., 114 Liberty St., New York City
Telephone: 4337-4338 Rector

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Purifiers
Horne Mfg. Co.

Anchors, Guy
Electric Service Sup. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Axles
Bemis Car Truck Co.
Cambria Steel Co.
Midvale Steel & Ordnance Co.
St. Louis Car Co.

Axles, Car Wheel
Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Works Co.
Westinghouse E. & M. Co.

Axle Straighteners
Columbia M. W. & M. I. Co.

Babbitt Metal
More-Jones Br. & Metal Co.

Babbitting Devices
Columbia M. W. & M. I. Co.

Badges and Buttons
Electric Service Sup. Co.
Internat'l Register Co., The

Batteries, Dry
National Carbon Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
General Electric Co.
More-Jones Br. & Metal Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Stucki Co., A.

Bells and Gongs
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
St. Louis Car Co.

Benders, Rail
Niles-Bement-Pond Co.
Railway Track-work Co.

Bending Apparatus
Railway Track-work Co.

Boilers
Babcock & Wilcox Co.

Boilers, Tubes
Cambria Steel Co.
Midvale Steel & Ordnance Co.
National Tube Co.

Bond Testers
American Steel & Wire Co.
Rail Welding & Bonding Co.

Bonding Apparatus
American Steel & Wire Co.
Electric Ry. Improv. Co.
Electric Service Sup. Co.
Ohio Brass Co.
Rail Welding & Bonding Co.

Bonds, Rail
American Steel & Wire Co.
Copper Clad Steel Co.
Electric Ry. Improv. Co.
Electric Service Sup. Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Rail Welding & Bonding Co.
Westinghouse E. & M. Co.

Book Publishers
McGraw-Hill Book Co.

Boring Tools, Car Wheel
Niles-Bement-Pond Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)
American Bridge Co.
Bates Exp. Steel & Tr. Co.
Electric Ry. Equip. Co.
Electric Service Sup. Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Hamilton & Hansell, Inc.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Amer. Br. Shoe & Fdry. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Horne Mfg. Co.
Johns-Manville, Inc.
National Brake Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Bridges and Buildings
American Bridge Co.

Brooms, Track, Steel or Rattan
Amer. Rattan & Reed Mfg. Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co., Inc.
National Carbon Co.
U. S. Graphite Co.
Westinghouse E. & M. Co.

Brush Holders
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.

Brushes, Graphite
National Carbon Co.

Bunkers, Coal
American Bridge Co.

Buses, Motor
Brill Co., The J. G.

Bushings
Nat'l Fibre & Insulation Co.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.

Cables (See Wires and Cables)

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures
Elec. Service Supplies

Car Panel Safety Switches
Westinghouse E. & M. Co.

Cars, Dump
Differential Car Co.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cambria Steel Co.
Kuhlman Car Co., G. C.
Midvale Steel & Ordnance Co.
National Ry. Appliance Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.
Transit Equipment Co.

Cars, Self-Propelled
General Electric Co.

Castings, Brass, Composition or Copper
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
More-Jones Br. & Metal Co.

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Standard Steel Works Co.
St. Louis Car Co.

Castings, Malleable and Brass
Amer. Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley
Electric Service Sup. Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Circuit Breakers
Automatic Reclosing Circuit Breaker Co.
Cutter Co.
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Anderson Mfg. Co., A. & J. M.
Electric Ry. Equip. Co.
Electric Service Sup. Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers—Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets
General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding Machines
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.

Coils, Armature and Field
Cleveland Armature Works
Columbia M. W. & M. I. Co.
General Electric Co
Westinghouse E. & M. Co.

Coils, Choke and Kicking
General Electric Co.
Westinghouse E. & M. Co.

Coin-Counting Machines
Electric Service Sup. Co.
Internat'l Register Co., The
Johnson Fare Box Co.

Commutator Slotters
Electric Service Sup. Co.
General Electric Co.
Westinghouse E. & M. Co.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Elec'l. Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Tr. Br. Co.

Concrete Reinforcing Bars
Cambria Steel Co.
Midvale Steel & Ordnance Co.

Condensers
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Connectors, Solderless
Frankel Connector Co.
Westinghouse E. & M. Co.

Connectors, Trailer Car
Electric Service Sup. Co.

Controllers or Parts
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Electric Service Sup. Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Conveying and Hoisting Machinery
American Bridge Co.
Columbia M. W. & M. I. Co.

Copper Wire
Anaconda Copper Min. Co.
Copper Clad Steel Co.

Cord Adjusters
Nat'l Fibre & Insulation Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Sup. Co.
Internat'l Register Co., The
Roebling's Sons Co., J. A.
Samson Cordage Works
Silver Lake Co.

Cord Connectors and Couplers
Electric Service Sup. Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
Amer. Steel Foundries
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cranes
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tile Co.

Crossing Signals (See Signals, Crossing)

Crossings, Frog and Switch
Wharton, Jr., & Co., Wm.

Crossings, Track (See Track, Special Work)

Crushers Rock
Allis-Chalmers Mfg. Co.

Curtains and Curtain Fixtures
Brill Co., The J. G.
Electric Service Sup. Co.
Morton Mfg. Co.
St. Louis Car Co.

Dealers' Machinery
Archer & Baldwin
Electric Equipment Co.

Derailing Devices (See also Track Work)
Wharton, Jr., & Co., Wm.

Destination Signs
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.

Detective Service
Wish Service, P. Edward

Dogs, Lathe
Williams & Co., J. H.

Door Operating Devices
Con. Car Heating Co.
Nat'l Pneumatic Co. Inc.

Doors and Door Fixtures
Brill Co., The J. G.
General Electric Co.

Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.

Draft Rigging (See Couplers)

Drills, Track
American Steel & Wire Co.
Electric Service Sup. Co.
Niles-Bement-Pond Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Sup. Co.

Electrical Wires and Cables
Amer. Electrical Works
American Steel & Wire Co.
Roebling's Sons Co., J. A.

Engineers, Consulting, Contracting and Operating
Allison & Co., J. R.
Archbold-Brady Co.
Arnold Co., The
Beeler, John
Byllesby & Co., H. M.
Clark & Co., Mgr., Corp., E. W.
Day & Zimmermann
Engel & Hevenor, Inc.
Feustel, Robert M.
Ford, Bacon & Davis
Gould, L. E.
Hemphill & Wells
Holst, Englehardt W.
Jackson, Walter
Kelley, Cooke & Co.
Parsons, Klapp, Brinkerhoff & Douglas
Richey, Albert S.
Sanderson & Porter
Sangster & Matthews
Smith & Co., C. E.
Stone & Webster
White Engineering Corp., The J. G.

Engines, Gas, Oil or Steam
Allis-Chalmers Mfg. Co.
Westinghouse E. & M. Co.

Fare Boxes
Cleveland Fare Box Co.
Economy Elec. Devices Co.
Johnson Fare Box Co.
National Ry. Appliance Co.

Fence
Cambria Steel Co.
Midvale Steel & Ordnance Co.

Fences, Woven Wire and Fence Posts
American Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Cleveland Fare Box Co.
Con. Car Fender Co.
Electric Service Sup. Co.

Fibre and Fibre Tubing
Continental Fibre Co.
Johns-Manville, Inc.
Nat'l Fibre & Insulation Co.
Westinghouse E. & M. Co.

Field Coils (See Coils)

Filters, Water
Scaife & Sons Co., Wm. B.

Fire Extinguishers
Johns-Manville, Inc.

Floodlights
Electric Service Sup. Co.

Flooring Composition
Amer. Mason Safety Tread Co.
Johns-Manville, Inc.

Floor Plates
Amer. Abrasive Metals Co.

Forgings
Cambria Steel Co.
Columbia M. W. & M. I. Co.
Midvale Steel & Ordnance Co.
Standard Steel Works Co.
Williams & Co., J. H.

Frogs, Track (See Track Work)

Funnel Castings
Wharton, Jr., & Co., Wm.

Fuses and Fuse Boxes
Columbia M. W. & M. I. Co.
General Electric Co.
Johns-Manville, Inc.
Westinghouse E. & M. Co.
Williams & Co., J. H.

Fuses, Refillable
Columbia M. W. & M. I. Co.
General Electric Co.

Gages, Oil and Water
Ohio Brass Co.

Gaskets
Johns-Manville, Inc.
Power Specialty Co.
Westinghouse Tr. Br. Co.

Gas-Electric Cars
General Electric Co.

Gasolene Torches
Economy Elec. Devices Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.

Gear Blanks
Cambria Steel Co.
Midvale Steel & Ordnance Co.
Standard Steel Works Co.

Gear Cases
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
General Electric Co.
National Ry. Appliance Co.
Nuttall Co., R. D.
Tool Steel Gear & Pinion Co.

Generating Sets, Gas-Electric
General Electric Co.

Generators
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Gongs (See Bells and Gongs)

Graphite
Morganite Brush Co., Inc.

Greases (See Lubricants)

Grinders and Grinding Supplies
Metal & Thermit Corp.
Railway Track-work Co.

Grinding Blocks and Wheels
Railway Track-work Co.

Guards, Cattle
American Bridge Co.

Guards, Trolley
Electric Service Sup. Co.
Ohio Brass Co.

Harps, Trolley
Anderson Mfg. Co., A. & J. M.
Electric Service Sup. Co.
More-Jones Br. & Metal Co.
Nuttall Co., R. D.
Star Brass Works

Headlights
Electric Service Sup. Co.
General Electric Co.
Ohio Brass Co.
St. Louis Car Co.

Heaters, Car (Electric)
Con. Car Heating Co.
Economy Elec. Devices Co.
Gold Car Heating & Lighting Co.
National Ry. Appliance Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Cooper Heater Co.
Smith Heater Co., Peter

Heaters, Car (Stove)
Electric Service Sup. Co.
Smith Heater Co., Peter

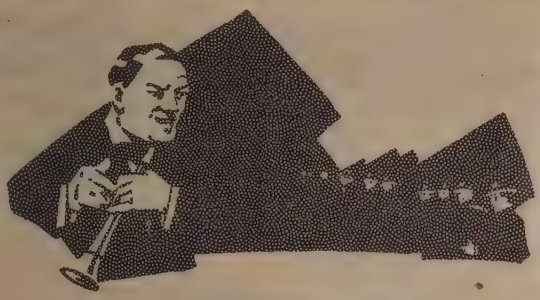
Hoists and Lifts
Columbia M. W. & M. I. Co.
Ford Chain Block Co.
Niles-Bement-Pond Co.

Hose, Bridges
Ohio Brass Co.

Hydraulic Machinery
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Instruments, Measuring, Testing and Recording
Economy Elec. Devices Co.
Electric Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Insulating Cloth, Paper and Tape
General Electric Co.



GETTING ATTENTION

Tooting a horn is one way, Advertising, another. If you have a business want make it known to the other readers of this paper. Reach the whole industry through an ad in the

SEARCHLIGHT SECTION

For Every Business Want

"Think* SEARCHLIGHT *First"

0154

The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

THE STAR BRASS WORKS

KALAMAZOO, MICH., U. S. A.

STEEL AND STEEL PRODUCTS

Midvale Steel and Ordnance Company
Cambria Steel Company

General Sales Office:
WIDENER BUILDING, PHILADELPHIA, PA.

DISTRICT SALES OFFICES:
Atlanta, Boston, Chicago, Cincinnati, Cleveland, Detroit, New York, Philadelphia, Pittsburgh, San Francisco, Salt Lake City, Seattle, St. Louis, Washington, D. C.

Consolidated Steel Corporation, 25 Broadway, New York, is the sole exporter of our commercial products.

DURSON BRAKE REGULATOR

Adjustment for slack is made on the application of the brake, not on the release.

Send for full details.

Hamilton & Hansell, Inc., 13 Park Row, New York, N. Y.

SPECIALISTS

in the

Design and Manufacture

of

Standard—Insulated—and Compromise Rail Joints

The Rail Joint Company
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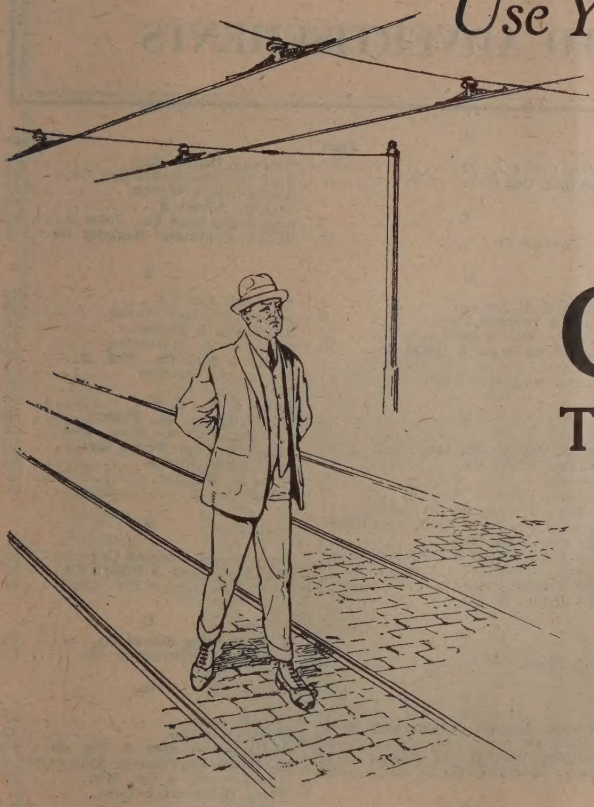

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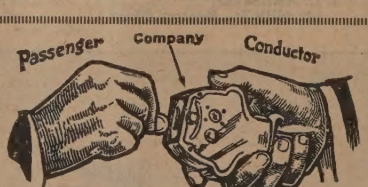

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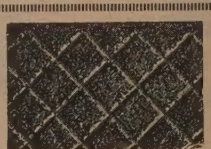

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Every city's development depends largely on its transportation system, and the electric railways have done more than any other industry in making possible the development of the largest cities and towns.

Electric railways, which find it difficult to meet existing demands for transportation in outlying districts, principally on account of the high cost of track installation, can install Brill "Rail-less" Cars to good advantage. By their adoption the expensive rail cost is avoided, and the economical cost of operation of these vehicles permit electric railways to provide necessary service, with a vehicle with which they are mostly familiar.

Write for copy of Brill Bulletin No. 254.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

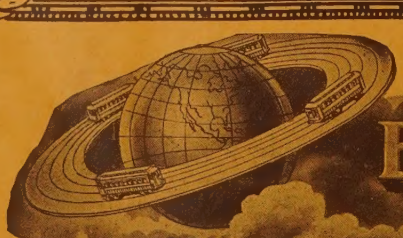
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

GREAT as is its present prestige, the full force of car card advertising would have remained undeveloped lacking a nationwide organization to realize its possibilities.

It is significant, then, that

—the growth of the Collier Organization has been an integral part in the growth of car card publicity.

CANDLER BUILDING, THE HOME OF COLLIER SERVICE



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